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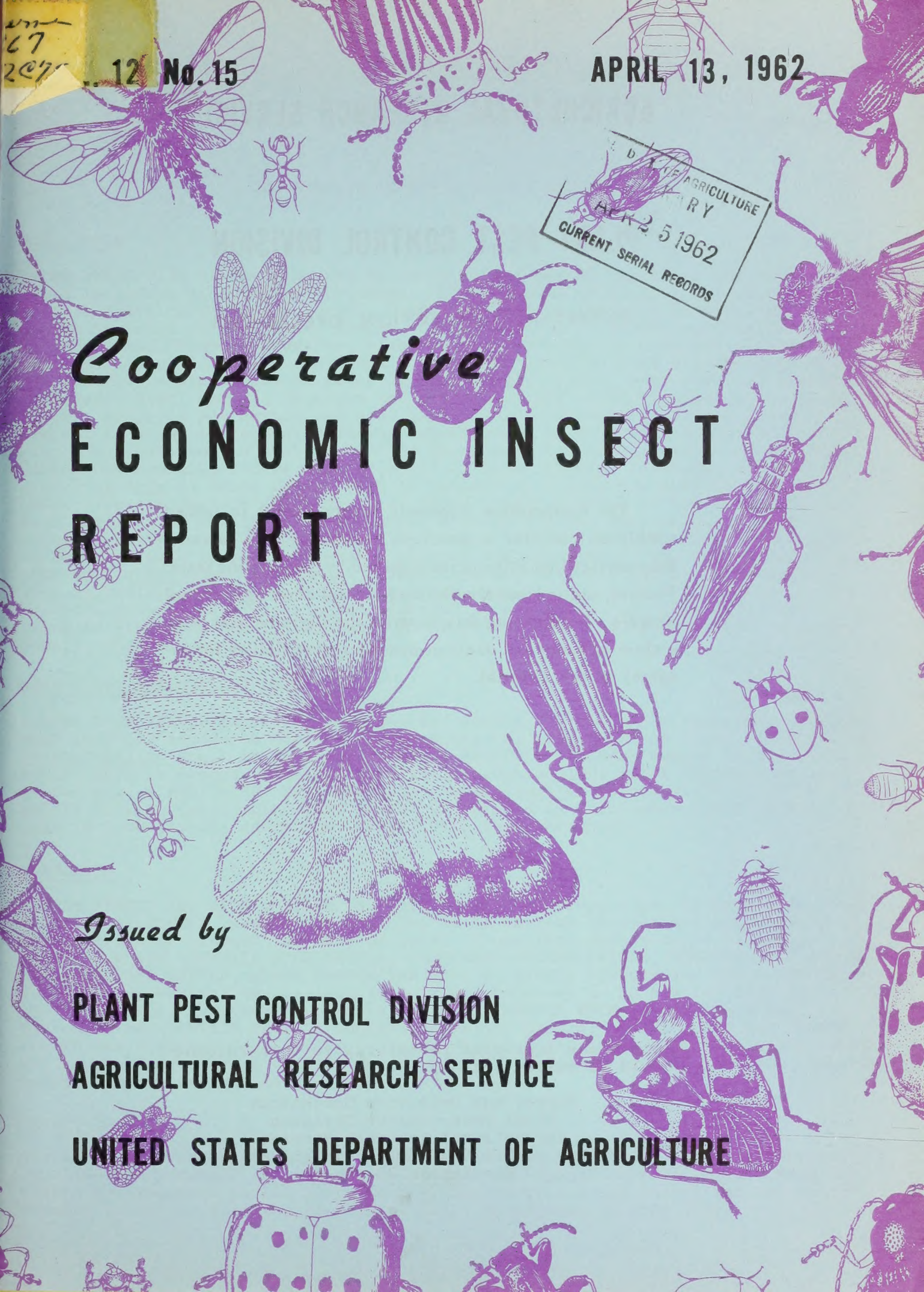

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
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Volume 12 April 13, 1962 Number 15

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

BROWN WHEAT MITE damage reported in areas of New Mexico and Texas and populations light to medium in southwest Oklahoma. Also present in several Colorado counties. ALFALFA WEEVIL active in Colorado, Utah and Wyoming; controls underway or completed in areas of two former States. First cutting of untreated alfalfa in Talladega and Chambers Counties, Alabama, will probably be completely destroyed by alfalfa weevil larvae. (p. 342). PEA APHID heavy in most Arizona alfalfa and controls contemplated on vetch in Hunt County, Texas; also reported active in Nevada, Utah, Kansas, Oklahoma and Maryland. ARMY CUTWORM causing damage to several crops in New Mexico and over large portion of central Texas; larvae present in wheat in several Colorado counties and in 2 Wyoming counties. Activity also continues in western half of Oklahoma. (p. 343). Larvae of SPRING CANKERWORM damaging flower buds of apple in Payne County, Oklahoma, and overwintering eggs of GREEN PEACH APHID 50 percent more numerous than in 1961 on peach trees in western Colorado. (p. 344). First instars of POTATO PSYLLID 8-10 per leaf on potato in many central Arizona fields; serious damage may occur if controls are not applied. (p. 346). FOREST TENT CATERPILLAR moderate to heavy on oaks throughout several central Texas counties; and egg masses of a BUCK MOTH (Hemileuca nevadensis) abundant on cottonwood trees not treated in 1961 at White Sands National Monument, New Mexico. (p. 347). SHEEP KED reported general in Wisconsin and averaged 30 per animal in flock of 1,000 sheep in Wabaunsee County, Kansas. HORSE BITING LOUSE heavy on horses in Osage County, Oklahoma. (p. 350).

SOME FIRST SEASONAL REPORTS

CLOVER LEAF WEEVIL larvae in Illinois and adults in California and Utah; CLOVER ROOT CURCULIO adults in Maryland and Washington; LYGUS BUGS in Idaho; LEAFHOPPERS (Aceratagallia spp.) in Utah and Wyoming; MEADOW SPITTLEBUG nymphs in Maryland; APPLE APHID in Oregon, Indiana, Maryland and Connecticut; PLUM CURCULIO adults in Georgia; a FRUIT-TREE MITE (Bryobia rubrioculus) in Colorado; TWO-SPOTTED SPIDER MITE in California; BEET LEAFHOPPER nymphs in California; PEAR PSYLLA eggs in Connecticut; and BLACK CHERRY APHID in Connecticut.

FORECASTS

CITRUS INSECT and MITE outlook in Florida, April through June, is given. (p. 345). A number of forest insects are expected to be serious in 1962 and suppression of infestations is planned for many of them. Those that appear to be of major importance are MOUNTAIN PINE BEETLE, ENGELMANN SPRUCE BEETLE, WESTERN PINE BEETLE, SOUTHERN PINE BEETLE, BLACK TURPENTINE BEETLE, SPRUCE BUDWORM and ELM SPANWORM. In addition, several defoliating insects are expected to be heavier than in 1961. Those of greatest importance are PINE TUSSOCK MOTH in Minnesota and Wisconsin and WESTERN HEMLOCK LOOPER in western Oregon. CANKERWORMS and LINDEN LOOPER are expected to be heavy in areas of the East, and FOREST TENT CATERPILLAR will again cause severe defoliation of several hardwoods in Louisiana and Alabama unless natural factors intervene.

DETECTION

New State records reported were a GRASSHOPPER (Melanoplus discolor) in Nebraska (p. 342) and a COCCID (Newsteadia americana) in Pennsylvania (p. 348). PEAR PSYLLA was recorded in San Diego County, California; a new county and the southernmost infestation in the State. (p. 344). (Continued on page 340).

SPECIAL REPORTS

Summary of Insect Conditions - 1961 (continued)

FOREST INSECTS - (p. 354).

CORRECTION and ADDITIONAL NOTES

See pages 352 and 353

Reports in this issue are for week ending April 6, unless otherwise indicated

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WEATHER OF THE WEEK ENDING APRIL 9

The week was cold in the central and southeastern portions of the Nation, and in the coastal area of Washington, with normal or above averages elsewhere. As the period progressed, temperatures warmed in southern and coastal areas and the freezing line was pushed inland, but not before Harrisburg, Pennsylvania, recorded 24° on the 4th to equal the record low there for that date.

Skies held clear for much warming in the Southwest and temperatures reached into the 90's in interior desert regions on the last 4 days. On the final day of the period, stations in southern Texas observed the mercury over the 90° mark, although temperatures averaged much below normal in most of that State. Dallas had 9° less than normal for one of the greatest departures in the Nation. On the warm side of the ledger, the deserts of the Far Southwest and the northern portion of Maine registered the largest positive departures. Cool, dry weather was general as the period opened, but as it progressed, much of the country was covered by variable amounts of precipitation. Most of California, Arizona, southern Nevada and the upper reaches of the Colorado River received no rain at all. Only very light amounts fell in New Mexico and southern Colorado and from Kansas northward through the Missouri Valley.

A large high pressure area dominated the East from the Mississippi Valley to the Atlantic coast until midperiod, when a weak disturbance in the western Gulf area caused rain to spread northward through most of Texas and into Wisconsin and Michigan. As this disturbance moved northeastward, showers and thunderstorms spread into the Appalachian and Atlantic Coast States. Following behind this small storm was a deeper and more severe storm which had moved from the Pacific Northwest, leaving some snow in the Rockies and northern Plains. On the final 2 days of the period, this storm left up to 12 inches of snow at International Falls, Minnesota, and lighter amounts in the surrounding area. A trailing cold front set off thunderstorms and showers down through Illinois and Arkansas.

The Pacific Northwest received significant precipitation nearly every day during the period. The greatest amount, however, fell in southern Mississippi where D'Lo had 5.04 inches, and sections of the southern Appalachians received over 2 inches to further increase the already high soil moisture in much of that area. Precipitation in the central Plateau and central Rocky Mountain areas fell in the form of light, scattered showers, and high winds caused some damage to farm installations in Utah.

Snow cover is gone east of the Rockies, except in a few extreme northern sections, particularly shaded and wooded areas. Much of the mountain area of the West still has large amounts of snow on the ground. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - NEW MEXICO - Generally light in most fields checked in Quay and Curry Counties. Averaged 6-8 per linear foot in fields near San Jon, Quay County. (N. M. Coop. Rpt.). TEXAS - Dry weather and slow growth of wheat in panhandle area increasing amount of apparent damage by this pest. (Texas Coop. Rpt.). OKLAHOMA - Populations continue at levels reported in CEIR 12(14):305. Noneconomic populations observed in all north central counties surveyed. Counts in Payne County noneconomic, except one field with up to 50 per linear foot. No evidence of "greenbug spots." Populations in southwest remain light; counts per foot ranged 5-40 in Tillman, 8-35 in Kiowa and 2-40 in Washita Counties. Only limited control applied in Grandfield area, Tillman County. (Okla. Coop. Sur.). KANSAS - Found only in Cowley County; less than 10 per 100 sweeps. (Peters). COLORADO - Not found in eastern part of State. (Jenkins).

CORN LEAF APHID (Rhopalosiphum maidis) - TEXAS - Moderate on grain sorghum in Bee County. (Texas Coop. Rpt., Edgar). ARIZONA - Continues light to moderate on barley statewide. (Ariz. Coop. Sur.). NEVADA - Heavy on barley in Moapa Valley, Clark County. (Bechtel, Zoller).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Occasional light populations of less than 10 per linear foot observed in wheat in Payne, Garfield and Grant Counties. (Okla. Coop. Sur.).

APHIDS - ARKANSAS - Populations extremely low in northwest for this time of year. Buildup probably held down by occasional cold nights; temperatures in mid-twenties 2 nights during week ending April 7. (Ark. Ins. Sur.).

CHINCH BUG (Blissus leucopterus) - TEXAS - Averaged 2-3 per 100 plants of grain sorghum in Bee County. (Texas Coop. Rpt., Edgar).

EUROPEAN CORN BORER (Ostrinia nubilalis) - DELAWARE - Spring survival survey completed; average winter mortality was 64 percent. Borer reduction from all factors was lowest (56 percent) in Sussex County and highest (70 percent) in New Castle County. State average of 138 borers per 100 plants represents a high spring population. Average number of borers per 100 plants for fall of 1961 compared with spring of 1962, respectively, by county, were as follows: New Castle - 205 and 61; Kent - 523 and 178; Sussex - 399 and 176. The State average for the fall of 1961 was 375 compared with 138 for the spring of 1962. Pupation of overwintering borers first noted April 3; averaged 5 percent in Sussex and under one percent in Kent Counties. (Burbutis). MISSOURI - Survey of corn fields in New Madrid County, March 29, indicated average overwintering larval population of 1,895 borers per acre. This is approximately the same number of larvae that went into the winter. Field work just beginning in area because of inclement conditions. Borer numbers usually reduced considerably by spring plowing. (Keaster). ILLINOIS - Survival survey completed April 5. Percent living forms, by section, was as follows: Northeast - 78; northwest - 78; west 65; central - 80 (only one field); east - 75; west-southwest - 88 (only one field). State average was 75 percent living forms. (Ill. Ins. Rpt.). WISCONSIN - Examination of harvested corn fields in southwest area revealed overwintering mortality of 17 percent. Many fields showed high predation of larvae by birds. (Wis. Ins. Sur.). SOUTH DAKOTA - Percent winter mortality, by district, as follows: East central - 20 (2 counties); northeast - 30; north central - 18; central - 25. (Hintz).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - ARKANSAS - Ten additional fields surveyed in northwest to determine survival of overwintering borers, which originally infested 16.6 percent of stalks in these fields. Overwintering survival was 14.5 percent. Of 25 fields checked about March 1 and to be rechecked April 1, 14 were plowed during March; however, 11 fields rechecked April 2-3 indicated slight reduction in larvae present, which was not significant. (Ark. Ins. Sur.).

SOUTHERN CORNSTALK BORER (Diatraea crambidoides) - DELAWARE - An unusually heavy infestation observed this spring in old cornstalks in Felton, Kent County; averaged over one per stalk. (Burbutis).

HESSIAN FLY (Phytophaga destructor) - COLORADO - No flaxseed found in volunteer wheat in eastern part of State. (Jenkins).

BROWN WHEAT MITE (Petrobia latens) - NEW MEXICO - Heavy, spotted populations damaging wheat fields near San Jon, Quay County. (N. M. Coop. Rpt.). TEXAS - Dry weather and slow growth of wheat in panhandle area increasing apparent damage by this pest. (Texas Coop. Rpt.). OKLAHOMA - Continues light to medium in southwest area; counts per foot were 15-1,500 in Tillman and 20-200 in Kiowa Counties. Light populations also reported from Ellis, Cimmarron and Beaver Counties. Some limited treatment reported from Tillman and Cotton Counties. (Okla. Coop. Sur.). COLORADO - Ranged 6-20 per foot of drill row in western area of Cheyenne County; 0-2 per foot in eastern area of Cheyenne, Kit Carson, Yuma and Washington Counties. None found in Phillips, Sedgwick and Logan Counties. (Ransom, Jenkins).

GRASSHOPPERS - ARIZONA - Late March surveys indicate good plant growth on southeast area rangelands below 3,000 feet, with some overwintering adult and nymphal activity in warmer locations. Light populations moving into crops in local situations reported in central and southwest areas. (Ariz. Coop. Sur., PPC). NEBRASKA - Melanoplus discolor collected and determined from Lancaster County during 1961 as a new State record. (Bell, Pruess). SOUTH DAKOTA - Several Chortophaga viridifasciata collected in James River area of Hutchinson County by D. Parks. This species overwinters as partially grown nymphs; however, it is seldom economic. (Hintz).

ALFALFA WEEVIL (Hypera postica) - ALABAMA - Populations continue to increase in untreated fields in Talladega and Chambers Counties. First cutting will probably be completely destroyed. Scattered populations also defoliating white Dutch clover in fields near alfalfa. (Buttram). GEORGIA - Averaged 3 per bud on untreated alfalfa in Chattooga County. Fields treated in fall of 1961 had an occasional larva per sweep. Fields were checked in Fulton, Paulding, Polk, Floyd and Chattooga Counties. (Johnson). VIRGINIA - Light, local infestations of first instars present in Pittsylvania County. (Dominick, March 20). COLORADO - Adults active at lower elevations in Mesa County. Control applications underway or completed in most areas. (Bulla). UTAH - Adults active in northern and central counties; much acreage has been stubble-treated for control recently. (Knowlton). WYOMING - Very little activity noted in Platte, Goshen and Laramie Counties; few adults found in crowns of alfalfa plants. Alfalfa had one inch or less of growth in all areas surveyed. (Fullerton).

AN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Infestations in Yuma County alfalfa declined rapidly; now low in most fields. Two cuttings of most fields on Yuma Mesa and some fields in Yuma Valley were severely damaged. Infestations also declined in central part of State. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - MARYLAND - Conspicuous larval damage noted on red clover at 2 localities in Somerset County. (U. Md., Ent. Dept.). ILLINOIS - Surveys since March 7 revealed the following populations per square foot, by section: Northeast - ranged 0-3, averaged 1.3 in 3 fields; east - none found in 2 fields; west-southwest - ranged 0-9, averaged 2.8 in 5 fields. Populations ranged 0-9 per square foot and averaged 1.8 in all 10 fields checked; thus far, populations appear low. (Ill. Ins. Rpt.). CALIFORNIA - Heavy adult populations congregating on fence posts in Point Reyes area, Marin County. (Cal. Coop. Rpt.). UTAH - Adults active in Logan area, Cache County. (Knowlton).

CLOVER ROOT CURCULIO (Sitona hispidula) - MARYLAND - Adults active in clover and alfalfa in Calvert and Prince Georges Counties. (U. Md., Ent. Dept.). WASHINGTON - Adults active in Pullman area, Whitman County. (Johansen).

A WEEVIL (*Lixus* sp.) - WYOMING - Several adults found in alfalfa fields in Goshen County. (*Fullerton*).

PEA APHID (*Macrosiphum pisi*) - NEVADA - Averaged 10-20 per sweep in alfalfa at Las Vegas and *100-200* per sweep in Moapa Valley, Clark County. (Bechtel). UTAH - Present on alfalfa in Moab area, Grand County. (Knowlton). ARIZONA - Infestations heavy in most alfalfa, statewide. (Ariz. Coop. Sur.). TEXAS - Populations on vetch generally nondamaging in most areas; however, in Hunt County, populations severe enough that farmers are contemplating controls. (Turney). OKLAHOMA - Continues light on alfalfa throughout State; 20-35 per sweep common in north central area. Large numbers covered ground under old hay left from last season in one field in Garfield County, but numbers on plants not heavier than in other fields. (Okla. Coop. Sur.). KANSAS - Counts in alfalfa in southeast area ranged 0-1,500 per 100 sweeps, with average less than 100 per 100 sweeps. (Peters). MARYLAND - Ranged 1-4 per sweep on alfalfa in Somerset and Calvert Counties. (U. Md., Ent. Dept.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - NEVADA - Averaged 4-6 per sweep in Las Vegas and 0-3 per sweep in *Moapa Valley*, Clark County. (Bechtel). NEW MEXICO - There appears to be a minor buildup in few fields of alfalfa in northern Dona Ana County. (N. M. Coop. Rpt.). TEXAS - Counts of 50-100 per 5 sweeps on alfalfa common in Brazos and Burleson Counties. (Newton). OKLAHOMA - Light to medium on alfalfa in southwest area; 30-125 per square foot. Only occasional aphid noted in fields checked in Perkins area, north central. (Okla. Coop. Sur.). KANSAS - Not observed in any alfalfa fields checked in southeast area. (Peters).

LYGUS BUGS (*Lygus* spp.) - UTAH - *L. elisus* and *L. hesperus* active in Utah, Salt Lake, Weber *and Cache* Counties. (*Knowlton*).

LEAFHOPPERS - WYOMING - *Cuerna* sp. and *Aceratagallia* sp. becoming numerous in alfalfa and green growth *along* ditchbanks and *weed* areas in Platte, Goshen and Laramie Counties. (Fullerton). UTAH - *Aceratagallia* spp. very numerous in alfalfa and on rangeland in northern and *central* areas. (Knowlton, Dorst).

A THRIPS (*Frankliniella* sp.) - NEVADA - Heavy on alfalfa in Clark County. (Bechtel).

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - NEW MEXICO - Cutworm larvae, mostly this species, causing *light to heavy damage* to Austrian winter peas, small grains, safflower and lawns in Luna County. Larvae averaged 2-8 per square yard along borders of Austrian winter peas and 0-2 per square yard of safflower. Larvae severely defoliating alfalfa in southern Dona Ana County. (N. M. Coop. Rpt.). TEXAS - Continues economic over large portion of central area. Heavy, widespread infestations in Hays County destroyed stand of clover; field replanted to grain sorghum, which was also destroyed. (Texas Coop. Rpt., Massey). OKLAHOMA - Activity continues in alfalfa and wheat areas in western half of State; most larvae fully grown and will pupate shortly. (Okla. Coop. Sur.). COLORADO - Larvae in wheat ranged 0-2 per foot of drill row in Elbert, Cheyenne, Lincoln, Kit Carson, Yuma, Washington, Phillips, Sedgwick and Logan Counties. (LaQuey, Davidson, Carson, Jenkins). WYOMING - Few larvae found in winter wheat in areas of Goshen and Laramie Counties; averaged less than one per square foot. (Fullerton).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Medium to heavy infestations present on safflower. (*Ariz. Coop. Sur.*).

MEADOW SPITTLEBUG (*Philaenus spumarius*) - MARYLAND - First nymphs of season present on plantain at *Huntingtown*, Calvert County. (U. Md., Ent. Dept.).

WINTER GRAIN MITE (*Penthaleus major*) - CALIFORNIA - Heavy infestation present on orchardgrass in *Susanville*, Lassen County. (Cal. Coop. Rpt.).

FRUIT INSECTS

APPLE APHID (Aphis pomi) - MARYLAND - Newly hatched aphids noted on apple at Hancock, Washington County, April 5. (U. Md., Ent. Dept.). INDIANA - Readily found in Vincennes area by March 30. Aphids abundant in most apple orchards and prebloom control is suggested. (Hamilton, Apr.3). OREGON - Overwintering eggs began hatching in Willamette Valley April 6. (Every).

ROSY APPLE APHID (Anuraphis rosea) - NEW JERSEY - Controls recommended in apple orchards. (Ins.-Dis.-Weed Newsl.).

APHIDS - NEW JERSEY - Eggs hatching in southern apple orchards. (Ins.-Dis.-Weed Newsl.).

PEAR PSYLLA (Psylla pyricola) - CALIFORNIA - Medium infestation determined from sticky bands on pear trees in Julian, San Diego County. This is first infestation in county and southernmost infestation in State. (Cal. Coop. Rpt.).

PERIODICAL CICADA (Magicicada septendecim) - INDIANA - Nymphs feeding heavily on apple roots in Mitchell area. Some adults will emerge in this area during 1962, but much heavier emergence will occur in more easterly states. (Marshall, Apr. 3).

SPRING CANKERWORM (Paleacrita vernata) - OKLAHOMA - Infestations of up to 2 larvae per terminal bud observed on apple in Perkins area, Payne County. Some flowering buds showed extensive feeding damage. (Okla. Coop. Sur.).

EUROPEAN RED MITE (Panonychus ulmi) - MARYLAND - Moderate numbers of eggs noted on young apple trees in orchard at Fairland, Montgomery County, April 5. (U. Md., Ent. Dept.).

PLUM CURCULIO (Conotrachelus nenuphar) - GEORGIA - First adults of season taken from peach trees on March 19; fully developed egg found in female on same day. Pest appeared from hiberantion before controls were applied. Adults appeared in numbers on peach trees by March 28 with average of 2.5 in an orchard in full bloom near woods. Controls recommended. (Snapp).

GREEN PEACH APHID (Myzus persicae) - COLORADO - Overwintering eggs on peach trees in western part of State average 69 per 100 fruit buds. Eggs 50 percent more numerous than in 1961 which was year of high aphid incidence on peaches. Controls recommended. (Bulla).

PEACH TREE BORER (Sanninoidea exitiosa) - UTAH - Large number of peach trees infested at Farmington, Davis County. (Knowlton, Wadley).

A FRUIT-TREE MITE (Bryobia rubrioculus) - COLORADO - Hatching on peach in Mesa County. (Bulla).

A CARPOSINID (Bondia comonana) - CALIFORNIA - Heavy populations occurred on 4-acre cherry orchard in Stockton, San Joaquin County. (Cal. Coop. Rpt.).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - CALIFORNIA - Populations present early this season; heavy nymph and adult populations reported from almond trees in Tracy area, San Joaquin County. (Cal. Coop. Rpt.).

Citrus Insect Situation in Florida - End of March - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 54 percent of groves (norm 59 percent); 31 percent economic (norm 34 percent). Populations will continue slightly below average and far below unusually high level that prevailed last year at this time. Highest districts are west coast, Bartow and Brooksville. CITRUS RED MITE (Panonychus citri) infested 35 percent of groves (norm 71 percent); 9 percent economic (norm 45 percent). Mites will increase on new leaves but little change expected from record low population level prevailing this spring. Highest district is west coast. TEXAS CITRUS MITE (Eutetranychus banksi) infested 28 percent of groves (norm 21 percent); 11 percent economic (norm 9 percent). Population moderate and will not increase greatly until May. All districts low. FLORIDA RED SCALE (Chrysomphalus aonidum) infested 40 percent of groves (norm 48 percent); 4 percent economic (norm 8 percent). Below average population will continue. Over 75 percent of scales in young stages. All districts low. PURPLE SCALE (Lepidosaphes beckii) infested 84 percent of groves (norm 79 percent); 15 percent economic (norm 16 percent). Although most groves have light infestations, very few expected to become heavy. Most scales nearing early adult stage and susceptible to parasite attack. Highest districts are ridge and Brooksville. BLACK SCALE (Saissetia oleae) infested 40 percent of groves (norm 12 percent); 14 percent economic (norm 2 percent). Although population is decreasing, it is still a record high for this date. Most scales nearing adult stage which indicates hatching of important summer generation will start latter part of April. Although SIX-SPOTTED MITE (Eotetranychus sexmaculatus) is near average moderate level, no infestations threating. APHIDS will continue below average abundance, but a few young groves and Temples may develop destructive infestations. CHAFF SCALE (Parlatoria pergandii) infested 70 percent of groves; 2 percent economic. WHITEFLIES, GLOVER SCALE (Lepidosaphes gloverii) and PYRIFORM SCALE (Protopulvinaria pyriformis) have populations above normal levels. (Simanton, Thompson, Johnson (Citrus Exp. Sta., Lake Alfred)).

Citrus Insect and Mite Outlook in Florida - April Through June 1962 - CITRUS RUST MITE (Phyllocoptruta oleivora) populations will remain below average in April, increase to average in May and to above average status in June; about 40 percent of groves will have injurious infestations. CITRUS RED MITE (Panonychus citri) populations will remain low through May then increase to peak at average level in June. TEXAS CITRUS MITE (Eutetranychus banksi) will increase until mid-June and reach high level recorded in 1961. FLORIDA RED SCALE (Chrysomphalus aonidum) populations will increase gradually, but fewer groves than usual will develop high infestations. Light PURPLE SCALE (Lepidosaphes beckii) infestations will be present in nearly all groves with a few, scattered, high infestations occurring in June. A high population of BLACK SCALE (Saissetia oleae) crawlers will appear on leaves late in April; majority of groves expected to have heavier twig infestations than usual in June. CHAFF SCALE (Parlatoria pergandii) population will continue above average. GLOVER SCALE (Lepidosaphes gloverii) may develop moderate infestations in scattered groves. APHID infestations will be light. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) will increase through April but injurious infestations will be fewer than average. The outlook given here is based on the assumption that weather beyond the period of the current U. S. Weather Bureau's 30-day Outlook will be normal. Departures from these normal conditions may affect citrus insect and mite populations directly or indirectly in a number of ways. Therefore, the forecast above should not be viewed with the same degree of confidence as the "Citrus Insect Situation" reports published twice each month in the Cooperative Economic Insect Report. (Simanton, April 4).

PYRIFORM SCALE (Protopulvinaria pyriformis) - FLORIDA - Severely infested grapefruit at Lakeland, Polk County, on March 27. (Simanton, Anderson).

A SOFT SCALE (Coccus elongatus) - FLORIDA - Severely infested grapefruit at Lakeland, Polk County, on March 27. (Simanton, Anderson).

EIGHT-SPOTTED FORESTER (Alypia octomaculata) - TEXAS - Moderate, local infestation caused light damage to grapes in Guadalupe County. (New).

SCALE INSECTS - NEW JERSEY - Controls recommended on blueberries. (Ins.-Dis.-Weed Newsl.).

TRUCK CROP INSECTS

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Light infestations present in some lettuce in central and southwestern fields. (Ariz. Coop. Sur.).

VARIEGATED CUTWORM (Peridroma saucia) - OKLAHOMA - Observed in home gardens in Stillwater area, Payne County. (Okla. Coop. Sur.).

IMPORTED CABBAGEWORM (Pieris rapae) - FLORIDA - Adults caught in flight at Bradenton, Manatee County. (Frederic, March 29).

GREEN PEACH APHID (Myzus persicae) - CALIFORNIA - Light populations appearing on aspargus in Torrence, Los Angeles County. (Cal. Coop. Rpt.). NEVADA - Mostly light with some medium infestations on sugar beets in Moapa Valley, Clark County. (Bechtel, Zoller). ARIZONA - Medium to heavy on potatoes and other plants, but infestations on lettuce light. (Ariz. Coop. Sur.).

POTATO APHID (Macrosiphum euphorbiae) - CALIFORNIA - Light populations appearing on asparagus at Torrence, Los Angles County. (Cal. Coop. Rpt.).

HARLEQUIN BUG (Murgantia histrionica) - TEXAS - Moderate, local infestations attacking greens in Travis County. (Chapman).

LYGUS BUGS (Lygus spp.) IDAHO - Occurring spottedly in gardens in Caldwell area, Canyon County. (Bechtolt, March 23).

POTATO PSYLLID (Paratrioza cockerelli) - ARIZONA - First instars present in many central potato fields with counts of 8-10 per leaf in some. Adult activity heavy and egg counts of 30-40 per leaf common. Indications are that pest may be present in sufficient numbers to seriously damage potatoes this year unless controls are applied. (Ariz. Coop. Sur.). CALIFORNIA - Heavy populations, probably this species, being collected on sticky board traps in Little Rock area, Los Angeles County. (Cal. Coop. Rpt.).

PILLBUGS - TEXAS - Caused moderate to heavy local damage to young lettuce, bean and other tender crops in Washington County. (Texas Coop. Rpt., McClung).

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Treatment in Imperial Valley completed during week ending April 6. Approximately 1,000 acres treated with ground rigs and 17,000 acres of brushlands, surrounding cultivated fields, treated by helicopter. Nymphs hatching in foothills areas of San Joaquin Valley; weather conditions will determine spring treatment in area. (Cal. Coop. Rpt.).

ONION THRIPS (Thrips tabaci) - NEVADA - Medium to heavy on green onions in Moapa Valley, Clark County. (Bechtel, Zoller).

ARMY CUTWORM (Chorizagrotis auxiliaris) - TEXAS - Damaged onions in Travis, Comanche and Hays Counties. (Texas Coop. Rpt.).

WINTER GRAIN MITE (Penthaleus major) - CALIFORNIA - Heavy infestation occurred on garlic plants in Susanville, Lassen County. (Cal. Coop. Rpt.).

SWEETPOTATO WEEVIL (Cylas formicarius elegantulus) - FLORIDA - Collections made in Santa Rosa, Suwannee, Taylor and Lafayette Counties during period of March 7-20. Det. by W. Breidenbach. (Fla. Coop. Sur.).

STRAWBERRY WEEVIL (Anthonomus signatus) - NEW JERSEY - Expected to be active on strawberries soon; controls recommended. (Ins.-Dis.-Weed Newsltr.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - CALIFORNIA - Heavy populations occurred on strawberry plantings in Artesia, Los Angeles. (Cal. Coop. Rpt.).

CUTWORMS - NEW JERSEY - Some feeding observed on strawberries; controls recommended. (Ins.-Dis.-Weed Newsltr.).

MITES - NEW JERSEY - Not yet active on strawberries. (Ins.-Dis.-Weed Newsltr.).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - CALIFORNIA - Heavy populations on leaves of strawberry in Artesia, Los Angeles County. (Cal. Coop. Rpt.).

TOBACCO INSECTS

SNAILS AND SLUGS - SOUTH CAROLINA - Became a problem in certain locations on tobacco beds during February in Marion County. (Nettles et al).

COTTON INSECTS

BOLLWORMS (Heliothis spp., et al.) - TEXAS - Light terminal feeding of noneconomic proportions noted in several fields of cotton in Rio Grande Valley. (Deer).

PINK BOLLWORM (Pectinophora gossypiella) - ARIZONA - Examinations of cage tests at Safford by Dr. Wene revealed diapausing larvae in cocoons in soil outside bolls. They were at about one inch depth. (Ariz. Coop. Sur.). FLORIDA - Collected on wild cotton at Key Largo, Monroe County, March 28. Det. by W. Breidenbach. (Creamer).

COTTON APHID (Aphis gossypii) - TEXAS - Infestations in Rio Grande Valley generally light; only an occasional field required treatment. (Deer).

THRIPS - TEXAS - Generally very light on cotton in Rio Grande Valley. (Deer).

A DARKLING BEETLE (Blapstinus sp.) - ARIZONA - Numerous larvae noted in some cotton fields in Pinal County. (Ariz. Coop. Sur.).

SEED-CORN MAGGOT (Hylemya cilicrura) - ARIZONA - Some damage to planted cottonseed has been reported in central area. (Ariz. Coop. Sur.).

SPIDER MITES - TEXAS - Generally very light on cotton in Rio Grande Valley. (Deer).

PILLBUGS - TEXAS - Causing economic damage to young cotton in Victoria County. (Texas Coop. Rpt.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

PINE NEEDLE SCALE (Phenacaspis pinifoliae) - CONNECTICUT - On increase this year in State; controls recommended. (Savos). VIRGINIA - Heavy on pines at a location in Lexington, Rockbridge County, March 8. (Amos).

A PINE RESIN MIDGE (Retinodiplosis sp.) - OREGON - Caused considerable damage to nursery plantings of pine in Lane County; nearly 100 percent were infested. Plants came from Coos County. (Larson).

TENT CATERPILLARS (Malacosoma spp.) - TEXAS - M. disstria moderate to heavy on oaks throughout several central area counties. Latest reports of serious damage received from Travis County. (Cook, Chapman). ALABAMA - First instars of M. americanum observed on native cherry in Tallapoosa, Chambers and Russell Counties. (Barwood). WISCONSIN - M. americanum egg masses scarce in area of Rock County where incidence of this pest has been perennially high. (Wis. Ins. Sur.).

A BUCK MOTH (Hemileuca nevadensis) - NEW MEXICO - Egg masses abundant on cottonwood trees, except in areas treated during 1961, at White Sands National Monument. (N. M. Coop. Rpt.).

CANKERWORMS - VIRGINIA - Wingless female of Alsophila pometaria collected near Blacksburg, Montgomery County, February 14. Det. by C. Covell. (Tarpley). ARIZONA - Probably Paleacrita vernata infesting some elms in Phoenix area, Maricopa County. (Ariz. Coop. Sur.).

CUTWORMS - NEVADA - Ufeus faunus heavy on poplar in Moapa Valley, Clark County. (Bechtel). Early instars of Oncocnemis punctilinea light on ash (Fraxinus sp.) at same location. (Bechtel, Zoller).

ELM LEAF BEETLE (Galerucella xanthomelaena) - OKLAHOMA - Present on trees and in homes in Woodward County. (Okla. Coop. Sur.).

PAINTED HICKORY BORER (Megacyllene caryae) - OKLAHOMA - Adults collected from elm trees in Carter County. (Okla. Coop. Sur.).

PACIFIC FLATHEADED BORER (Chrysobothris mali) - IDAHO - Probably this species, removed from mountain-ash at Weiser, Washington County. (Morrison, March 23).

SHOT-HOLE BORERS - TEXAS - Emerging adults of unspecified species making first appearance of season in Waller County. No serious damage observed. (Weaver).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Heavy on twigs and stems of Acer sp. in Marysville, Yuba County. (Cal. Coop. Rpt.).

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) - OREGON - Survey continues in western part of State. In period of March 21-30, inspection of 13,400 trees in Portland area completed by State Forestry Department; 154 laboratory samples submitted. Checking of all large nurseries in Portland area, Multnomah County, completed. There are no known infestations in the State. (Larson).

MIMOSA WEBWORM (Homadaula albizziae) - CALIFORNIA - Additional infestations found in Chico, Butte County. (Cal. Coop. Rpt.).

ORANGE TORTRIX (Argyrotaenia citrana) - OREGON - Severely damaged fern plantings in nursery in Portland, Multnomah County. (Nicolaison).

JUNIPER WEBWORM (Dichomeris marginella) - OREGON - Larvae caused severe damage to ornamental plantings of juniper in Corvallis, Benton County. (Ritcher).

GREEN PEACH APHID (Myzus persicae) - ALABAMA - Heavy infestations observed on greenhouse plantings, particularly roses, at 2 locations in Tallapoosa County. (Barwood). OKLAHOMA - Populations of 5 per leaf, probably this species, observed on Bougainvillea plants in greenhouse in Tulsa. (Okla. Coop. Sur.). DISTRICT OF COLUMBIA - All stages on flower buds of Aloe sp. on February 25. Collected by S. M. Dobanian; det. by M. D. Leonard. (Leonard). PENNSYLVANIA - Abundant and difficult to control on chrysanthemum and cineraria in greenhouse in Allegheny County. (Udine).

ROSE APHID (Macrosiphum rosae) - SOUTH DAKOTA - Infested rose bushes shipped in from an out-of-State nursery. (Mast).

APHIDS - MISSOURI - Light infestations of several species observed on leaf buds of ornamental plum and various other ornamentals in central area; aphids very small, buds just opening. (Munson). UTAH - Hatching on roses in north central area of State. (Knowlton).

A COCCID (Newsteadia americana) - PENNSYLVANIA - Slide recently discovered in F. M. Trumble collection of Pennsylvania Department of Agriculture. Specimens were collected by J. G. Sanders on roots of a tree June 27, 1917. Specimens were determined by H. Morrison, but were not recorded from State when his description was published in 1925. Therefore, this is the first published record of this species from Pennsylvania. (Sleesman).

COCCIDS - CALIFORNIA - Protopulvinaria pyriformis adults heavy on Brassaia actinophylla in a nursery in Corona, Riverside County. (Cal. Coop. Rpt.). TEXAS - Moderate populations of Icerya purchasi on various ornamentals becoming heavy, with damage evident. Controls required in many instances. (Frobese). OKLAHOMA - Unaspis euonymi infestations reported from Greer, Stephens, Oklahoma and Payne Counties. (Okla. Coop. Sur.). MISSOURI - Light to moderate infestations of an undetermined species observed on undersides of leaves of Buford holly in nurseries in St. Louis area. (Lenhardt). VIRGINIA - Unaspis euonymi heavy on silver holly at a locality in Natural Bridge, Rockbridge County, March 15; and heavy on euonymus at localities in Goodview, Bedford County, March 7, and in Colony, Amherst County, March 19. (Amos, Rowell). MARYLAND - Aspidiotus ithaca light on ornamental hemlock at Olney, Montgomery County. (U. Md., Ent. Dept.). PENNSYLVANIA - Saissetia hemisphaerica medium on ferns in greenhouse in Huntingdon, Huntingdon County. (Udine).

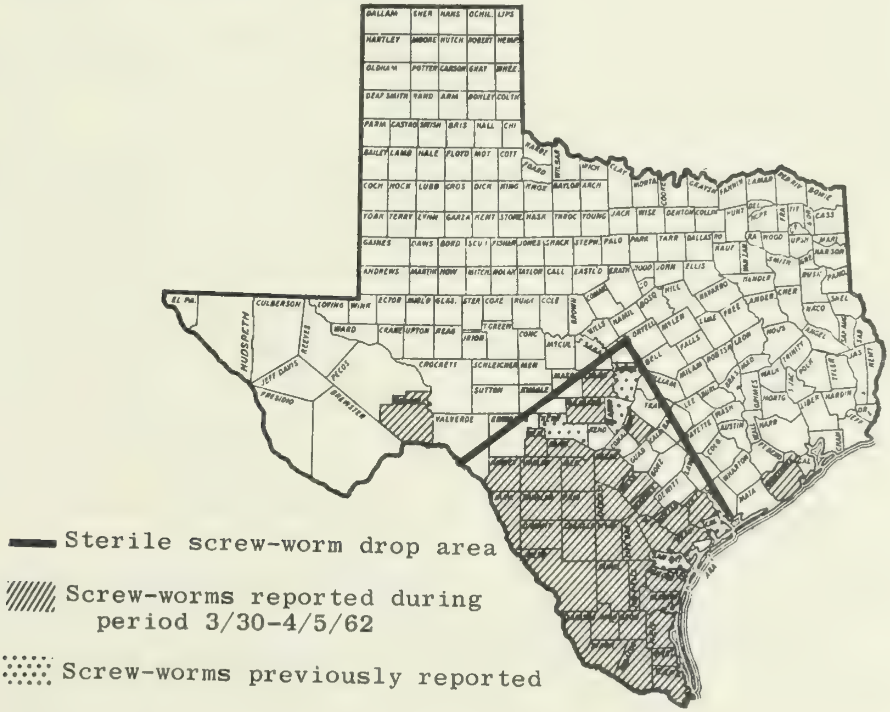
CITRUS RED MITE (Panonychus citri) - CALIFORNIA - Heavy on Englishlaurel in a nursery at Ross, Marin County. (Cal. Coop. Rpt.).

SPIDER MITES - ALABAMA - Increased activity of undetermined species causing some concern on boxwoods, camellias and conifers in Tallapoosa County. (Barwood). PENNSYLVANIA - Nymphs of Tetranychus sp. medium on croton in greenhouse at Pittsburgh, Allegheny County. Det. by R. J. Snetsinger. (Udine, Feb. 14).

PRIVET MITE (Brevipalpus obovatus) - PENNSYLVANIA - Medium infestation present on grape and ivy in greenhouse at Pittsburgh, Allegheny County. Det. by R. J. Snetsinger. (Udine, Feb. 14).

PILLBUGS - TEXAS - Causing noticeable damage to new growth of several ornamental plant species in Washington and Bee Counties. (Texas Coop. Rpt., McClung, Edgar).

INSECTS AFFECTING MAN AND ANIMALS


▬ Sterile screw-worm drop area
▨ Screw-worms reported during period 3/30-4/5/62
⁘ Screw-worms previously reported

SCREW-WORM (Cochliomyia hominovorax) - TEXAS - Release of sterile flies continued in southern area. Map above gives status of the program in southern Texas as of April 5. During the week ending April 5, 10,698,800 sterile flies were released over an area of 43,198 square miles, with a release rate of 200-250 flies per square mile for this period. Also during the week, 218 infestations were reported, including 11 in 6 new counties, as follows: Atascosa - 5; La Salle - 2; Bexar - 1;

Real - 1; Wilson - 1; Terrell - 1. The 218 cases reported during this period demonstrate a rapid increase in populations, despite release of sterile flies in southern area. Within a period of 4 weeks, reported cases have increased from 38 to 218. Production at Kerrville is too limited to allow expansion of routine release pattern northwestward along Rio Grande River; however, limited linear release will be initiated along river north to a point near Truth or Consequences, New Mexico. (Anim. Dis. Erad. Div.).

CATTLE GRUBS (Hypoderma spp.) - NORTH DAKOTA - Larvae dropping from backs of cattle in McKenzie and Dunn Counties. (N. D. Ins. Sur.). OKLAHOMA - H. lineatum adult activity noted around cattle herds throughout south central and north central areas. (Okla. Coop. Sur.). MARYLAND - H. lineatum larvae ranged 10-15 per animal in small herd of short horn steers in Baltimore County April 3. Development of Hypoderma spp. over State appears to be at least a month later than at corresponding times in previous years. (U. Md., Ent. Dept.).

HORN FLY (Haematobia irritans) - OKLAHOMA - Light populations of 3-5 per cow and 10 per bull observed in Payne County; also reported from Carter County. (Okla. Coop. Sur.).

FACE FLY (Musca autumnalis) - MINNESOTA - Overwintering adults reported in homes in Wabasha and Brown Counties. (Minn. Ins. Rpt.). ILLINOIS - None found on 2 herds of cattle examined. (Ill. Ins. Rpt.).

BLOW FLIES - UTAH - Unspecified species numerous about cattle and hog feeding areas in Weber and northern Davis Counties. (Knowlton). NEBRASKA - Calliphora sp. active throughout southern fourth of State. (Rapp). OKLAHOMA - Phormia regina noted about cattle in Atoka County. (Okla. Coop. Sur.).

SHEEP KED (Melophagus ovinus) - WISCONSIN - Infested 299 flocks of 7,666 inspected; total number of sheep was 231,758. Distribution of this pest appeares to be general. (Wis. Ins. Sur.). KANSAS - Averaged 30 per animal in flock of 1,000 sheep in Wabaunsee County, March 29. (Pitts).

MOSQUITOES - NEBRASKA - First instars of Aedes sp. active near Table Rock, Pawnee County. (Rapp). UTAH - Larvae of unspecified species active in Salt Lake City area. (Collett).

AN EYE GNAT - ARIZONA - Heavy populations of an unspecified species a problem along Colorado River in northern Yuma County. (Ariz. Coop. Sur.).

HOG LOUSE (Haematopinus suis) - TEXAS - Heavy on hogs in Bee, Live Oak and McMullen Counties. (Texas Coop. Rpt., Edgar).

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus) - NORTH DAKOTA - Controls applied to herd of cattle in McKenzie County. (N. D. Ins. Sur.).

HORSE BITING LOUSE (Bovicola equi) - OKLAHOMA - Heavy populations of 5-15 per hair part observed on horses in Osage County. (Okla. Coop. Sur.).

LICE - TEXAS - Infestations reported on cattle in Bee, Live Oak and McMullen Counties. (Texas Coop. Rpt., Edgar). OKLAHOMA - Activity of several species continues to be reported on cattle throughout eastern half of State. (Okla. Coop. Sur.). UTAH - Some cattle herds still seriously infested in Utah, Weber and Box Elder Counties. (Knowlton). WISCONSIN - Infested 228 flocks of 7,666 flocks, comprised of 231,758 sheep. Distribution of these pests appears to be general. (Wis. Ins. Sur.).

FLEAS (Ctenocephalides spp.) - NEBRASKA - Heavy infestations occurring on dogs in Lincoln, Lancaster County. (Bell).

SCAB MITES - VIRGINIA - All of 80 sheep inspected in December 1961 were infested with Psoroptes ovis and 522 of 538 sheep insepcted in January 1962 were also found infested with this species. (Tarpley). WISCONSIN - Of 7,666 flocks inspected (comprised of 231,758 sheep), 4 flocks found infested with P. ovis. Infested flocks were in Green Lake, Jefferson and Kenosha Counties. Three flocks were also found infested with Chorioptes ovis in Dodge, Eau Claire and Iowa Counties. (Wis. Ins. Sur.).

TROPICAL RAT MITE (Ornithonyssus bacoti) - PENNSYLVANIA - Taken from bodies of children in Harrisburg, Dauphin County. (Balsbaugh).

AMERICAN DOG TICK (Dermacentor variabilis) - NEBRASKA - Larval activity very abundant in Rulo area, Richardson County. (Rapp).

TICKS - TEXAS - Infestations of unspecified species noted on cattle in Bee, Live Oak and McMullen Counties. (Texas Coop. Rpt., Edgar).

BLACK WIDOW SPIDER (Latrodectus mactans) - MARYLAND - Adult female noted near home near Brandywine, Prince Georges County. (U. Md., Ent. Dept.).

HOUSEHOLD AND STRUCTURAL INSECTS

SUBTERRANEAN TERMITES - VIRGINIA - Unspecified species swarmed in Leesburg, Loudoun County, February 22, and at Petersburg, Dinwiddie County, March 24. (Rowell, Brown, Matheny). OKLAHOMA - Minor swarming of Reticulitermes tibialis noted in Stillwater area, Payne County. (Okla. Coop. Sur.). NEBRASKA - Swarming forms of Reticulitermes sp. found in Grant and Madison Counties. (Roselle). UTAH - Unspecified species damaging additional home in Ogden, Weber County, and home at Logan, Cache County. (Knowlton). IDAHO - Large infestation, probably Reticulitermes hesperus, reported in older home at Caldwell, Canyon County, during late February. (Bechtolt).

ANTS - UTAH - Tiny species infested homes at Logan, Cache County, and Ogden, Weber County. (Knowlton). MARYLAND - Winged forms of Monomorium minimum and Acanthomyops interjectus annoyed homeowners in Prince Georges County. (U. Md., Ent. Dept.).

CARPET BEETLE (Anthrenus scrophulariae) - NORTH DAKOTA - Several infestations reported in Fargo area, Cass County. (N. D. Ins. Sur.).

A FLOUR BEETLE (Tribolium sp.) - NORTH DAKOTA - Several infestations reported in Fargo area, Cass County. (N. D. Ins. Sur.).

A POWDER-POST BEETLE (Lyctus sp.) - TEXAS - Adults emerged from ash panelling in homes in Young County. Infestations seriously weakened wood in 65-year-old home in Harrison County. (Kennedy, Newton).

A SPIDER BEETLE (Mezium affine) - NEVADA - Heavy infestation in old carpets and padding in hotel in Las Vegas, Clark County. (Barton, Bechtel).

BOXELDER BUG (Leptocoris trivittatus) - PENNSYLVANIA - Emerging from hibernation March 28 in York County. (Nichols). MARYLAND - Troublesome around homes in Baltimore and Prince Georges Counties. (U. Md., Ent. Dept.). MINNESOTA - Nuisance in homes in Minneapolis-Saint Paul area. (Minn. Ins. Rpt.). NORTH DAKOTA - Heavy in home at Fargo, Cass County. (N. D. Ins. Sur.). NEBRASKA - Active in residential areas in Rulo, Richardson County. (Rapp). UTAH - Troublesome in homes east and south of Salt Lake City, Salt Lake County. (Knowlton).

BROWN-BANDED COCKROACH (Supella supellectilium) - WASHINGTON - Infested home at Mercer Island, King County. (Brannon).

CLOVER MITE (Bryobia praetiosa) - MARYLAND - A nuisance in homes in Montgomery and Washington Counties. (U. Md., Ent. Dept.). ALABAMA - Entered homes in De Kalb County. (Buttram). OKLAHOMA - Invaded home in Cleveland, Pawnee County.

(Okla. Coop. Sur.). UTAH - Very troublesome in homes in several Piute County communities. Entering homes at Brigham City, Box Elder County. (Knowlton, Buck).

STORED-PRODUCT INSECTS

A FLOUR BEETLE (Tribolium sp.). ARIZONA - Medium to heavy infestations present in and around some grain storage in central area. (Ariz. Coop. Sur.).

KHAPRA BEETLE (Trogoderma granarium) - OKLAHOMA - Results of inspections were negative in Muskogee County. (Okla. Coop. Sur.).

BEAN WEEVIL (Acanthoscelides obtectus) - COLORADO - Found in sample of dry pinto beans from Weld County. (Lawson).

A PHYCITID MOTH (Ephestia sp.) - COLORADO - Larvae found in sample of dry pinto beans from Weld County. (Lawson).

LITTLE HOUSE FLY (Fannia canicularis) - TEXAS - Adults caused concern in dairy feed storage room in Guadalupe County. (Tex. Coop. Rpt., Massey).

BENEFICIAL INSECTS

LADY BEETLES - CALIFORNIA - Heavy populations of adult Coleomegilla vittigera in Point Reyes area, Marin County. (Cal. Coop. Rpt.). UTAH - Several species occasionally encountered in fields and orchards in central and northern areas. (Knowlton).

MISCELLANEOUS INSECTS

A FRUIT FLY (Anastrepha interrupta) - FLORIDA - Collected in McPhail trap at Homestead on March 21 and at Miami March 22 in Dade County, and at Salerno, Martin County, on March 30. (Fay, Stephens, Prange).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - FLORIDA - Collected in Clay County on March 27; det by W. Breidenbach. (Fla. Coop. Sur.).

JAPANESE BEETLE (Popillia japonica) - CALIFORNIA - Four additional grubs dug from lawn turf in known heavily infested area in Sacramento County. Additional soil treatment began first of April in 100-block area. Traps being placed in locations of last year's adult collections. (Cal. Coop. Rpt.).

A SLUG (Arion ater) - CALIFORNIA - Survey in Humboldt County shows this slug to be rather widespread; additional specimens collected in Eureka, Fortuna and McKinleyville. (Cal. Coop. Rpt.).

CORRECTION

CEIR 12(14):312 - CARPENTER ANTS (Campnotus spp.) should read (Camponotus spp.).

LIGHT TRAP COLLECTIONS

	Agrot. ips.	Feltia subterr.	Helio. zea	Laphyg. frug.	Prod. ornith.	Pseud. unip.
ARKANSAS						
Kelso 3/29-4/4	1					1
FLORIDA						
Gainesville 3/29-4/4	3	20	4	11	4*	3
Quincy 3/5	5		1			
SOUTH CAROLINA						
Clemson 3/31-4/6					8	3
TENNESSEE (Counties)						
Blount 3/27-4/2	5				3	32
Cumberland 3/27-4/2	1					4
Greene 3/27-4/2	2				2	11
Johnson 3/27-4/2	1				1	2
Maury 3/27-4/2			1			6
Robertson 3/27-4/2						4

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* All male specimens.

Additional Light Trap Collections: WISCONSIN: Middleton (3/29, 30)-SPRING CANKERWORM (*Paleacrita vernata*) - 3; NOCTUIDS (3/29, 4/3-5)-*Lithophane laticinerea* - 6; *Eupsilia vinulenta* - 4; (4/3, 5)-*E. morrisoni* - 2.

ADDITIONAL NOTES

CONNECTICUT - APHIDS active and easy to find on small grains. APPLE APHID (*Aphis pomi*) active and heavy in some spots in Hamden-Cheshire area; pest appeared earlier than usual. No reports of ROSY APPLE APHID (*Anuraphis rosea*) yet. Egg laying by PEAR PSYLLA (*Psylla pyricola*) in Hamden, New Haven County, and Storrs, Tolland County; pest appears more numerous than last year. BLACK CHERRY APHID (*Myzus cerasi*) is active but not too numerous in the Storrs orchard. (Savos).

SUMMARY OF INSECT CONDITIONS - 1961
(Continued from page 338)

FOREST INSECTS

Highlights: There were explosive increases in populations of some species of BARK BEETLES and resultant tree-killing in outbreak areas was severe. MOUNTAIN PINE BEETLE increased at rates up to 10:1 in stands of lodgepole pine in portions of Utah, western Wyoming and southern Idaho, which resulted in the killing of more than 600,000 trees in 57 infestation centers -- the worst epidemic of this important insect at any time during the past 30 years. Smaller outbreaks of mountain pine beetle also occurred in stands of lodgepole pine at Crater Lake National Park and other locations in Oregon,and in Modoc County, California. The beetles were abundant and destructive in stands of western white pine in Idaho, Washington and parts of Oregon, and they killed sugar pines extensively in the southern Sierra Nevadas, California.

ENGELMANN SPRUCE BEETLE was less destructive in 1961 than in the past few years but outbreaks in local areas in Wyoming, Montana, Colorado and New Mexico killed large numbers of high-value Englemann spruce. The most serious infestations were on the Bridger National Forest, Wyoming, the Grand Mesa-Uncompahgre and Rio Grande National Forests, Colorado, and the Carson National Forest and adjacent private lands, New Mexico. With minor exceptions, the outbreaks in all areas were triggered by populations breeding in blow-down timber, cull logs, stumps and other debris in logging areas.

Deficiencies in precipitation and other factors favored outbreaks of the WESTERN PINE BEETLE and ENGRAVERS (Ips spp.) in stands of ponderosa pine at several locations in the Western States. In central and southern Oregon, especially on the Fremont, Ochoco, Malheur and Rogue River National Forests, western pine beetle killed large numbers of trees singly and in groups. This species was also abundant, for the first time in several years, on the Nezperce National Forest and the general area extending from Riggens to Kooskia, Idaho. In California, tree-killing by both species was most severe in second-growth stands in the foothill pine belt throughout the central and southern Sierra Nevadas and at several locations in virgin stands in those areas, and in southern California.

SOUTHERN PINE BEETLE and BLACK TURPENTINE BEETLE are perennial pests in the Southern and Southeastern States. The long-standing outbreak of the former species expanded greatly in the Big Thicket area of southeastern Texas and populations also developed to epidemic levels in portions of Alabama, Mississippi, South Carolina and Georgia. Black turpentine beetle increased significantly on all lowlands where logging was done by heavy equipment under wet conditions.

BLACK HILLS BEETLE continued in outbreak status in stands of ponderosa pine along the Front Range of the Central Rockies, in northern Wyoming and in the Black Hills of South Dakota. Elsewhere, infestations were less severe than in past years, due largely to sustained efforts to keep populations in check. Suppression in 1962 will be directed largely at outbreaks in Colorado and South Dakota.

There were large acreages of forest stands in all sections of the country severely damaged by several species of defoliating insects. SPRUCE BUDWORM was the most serious, occurring in epidemic numbers over large acreages from coast to coast. Some 80,000 acres of balsam fir were heavily defoliated in Maine. Upwards from 1,000,000 acres of spruce-fir stands in Minnesota were infested. In Montana, there was no increase in the $3\frac{1}{2}$ million-acre infestations, but there was a worsening in degree of defoliation. In Idaho, population densities increased sharply in a widespread area and damage to affected Douglas-fir stands was much greater there also. New outbreaks in southern Colorado, coupled with some spread of older infestations, resulted in a 13 percent increase in area of epidemics. In New Mexico, infestations occurred on more than a million acres, a 33 percent increase over 1960. There were critical infestations on about 50,000 acres in southern Washington. For the country as a whole, close to 10 million acres of fir timber were infested and tree-killing, particularly in the understory, was quite severe in most areas.

JACK-PINE BUDWORM defoliated jack pines in varying degrees on about 150,000 acres in parts of Michigan, Wisconsin and Minnesota. The most serious infestations were on approximately 40,000 acres in Wisconsin.

Sudden and severe outbreaks of PINE TUSSOCK MOTH occurred at several places in Minnesota and Wisconsin. Stands of red pine, jack pine and white spruce were completely defoliated on about 3,500 acres of the General Andrews State Forest, Minnesota. The pine species suffered severe defoliation at other locations in that State and on some 60,000 acres in Wisconsin. It is predicted that heavier populations will occur in the infested areas in 1962.

After a 10-year absence, the WESTERN HEMLOCK LOOPER reappeared in epidemic numbers on about 70,000 acres of hemlock forests of western Oregon. Defoliation ranged from light to heavy and caused some mortality to host trees in localized areas. Heavy populations are predicted in 1962.

LARCH CASEBEARER, first discovered in the West during 1957 in the vicinity of St. Maries, Idaho, continued to spread in that State and invaded Montana. In 1961, infestations occurred over a gross area of 9,000 square miles.

PINE NEEDLE MINER infestations were severe on extensive areas in the West. A species attacking ponderosa pine was damaging on 19,000 acres in the vicinity of Flaming Gorge Dam on the Green River, Utah. Elsewhere in Utah, and in Idaho and Montana, the LODGEPOLE NEEDLE MINER was in outbreak on some 200,000 acres. The latter species also was damaging to lodgepole pines in California, particularly at Yosemite National Park.

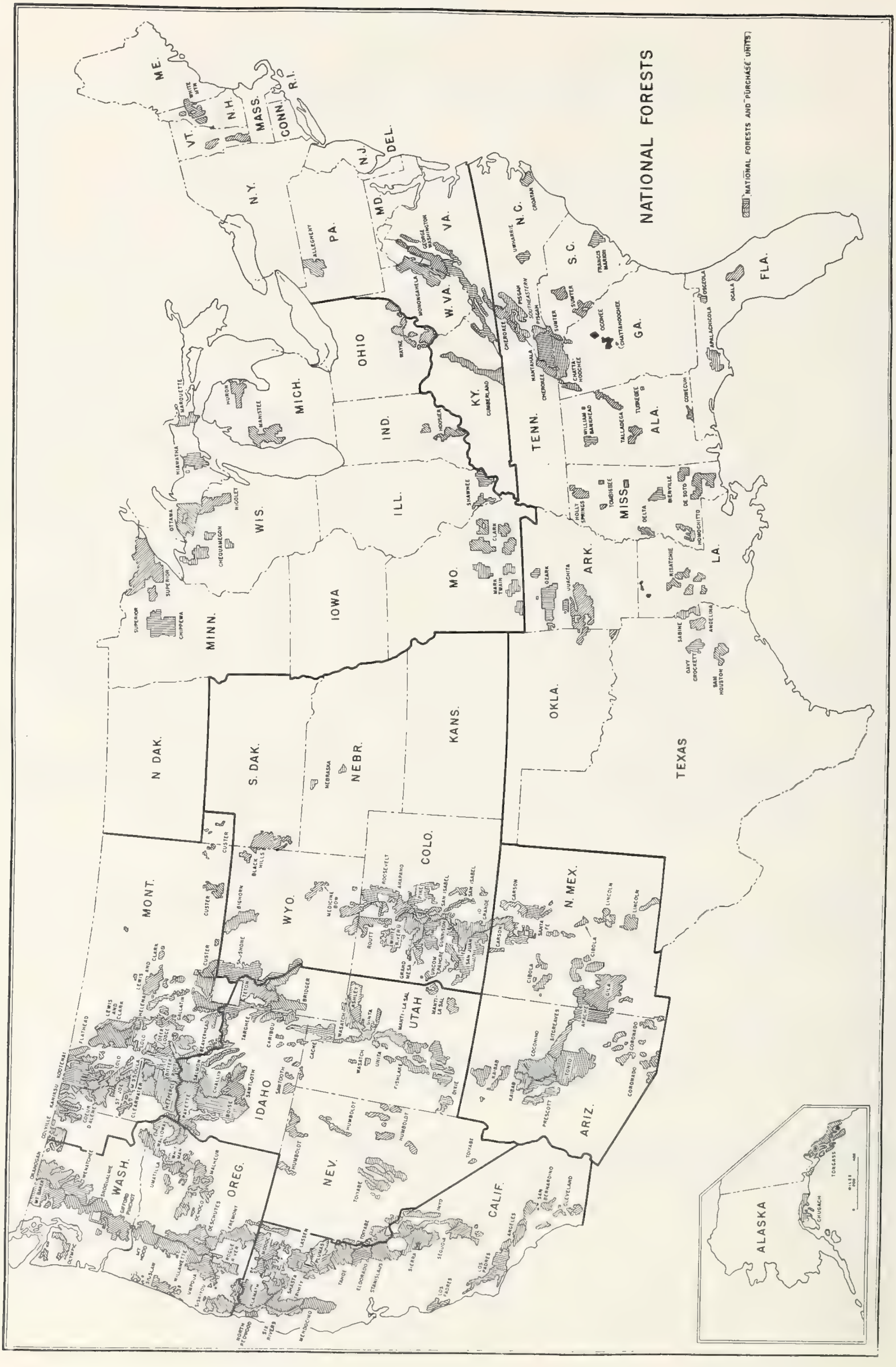
PANDORA MOTH, an important pest of pine forests in the Western States, occurred in epidemic numbers at several locations in 1959. By 1961, most infestations had declined to endemic levels due to natural control factors. One outbreak however, has persisted in the Rocky Mountains and some 36,000 acres of lodgepole pine were defoliated along the Colorado-Wyoming border.

In the tri-State area of Georgia, Tennessee and North Carolina, oaks, hickories and other hardwoods were severely defoliated by the ELM SPANWORM. The gross area of infestation was estimated at 1,532,000 acres, a slight decrease from 1960. However, the acreage of moderate to severe defoliation increased and heavy populations in some areas are predicted for 1962. The movement of the outbreak since its discovery several years ago has been in a northerly and easterly direction.

FOREST TENT CATERPILLAR severely defoliated water tupelo, blackgum, sweetgum and other bottomland hardwoods over extensive areas in Louisiana and Alabama during the spring. Infestations in both states covered approximately 2.1 million acres. Foliage was completely stripped from trees on more than half of the total area.

The map on the following page depicts the National Forests. It may be of value when reading the detailed Forest Insect Summary.

J. W. Bongberg,
Forest Insect and Disease Surveys
Forest Service



NATIONAL FORESTS

Forest Insect Suppression - Calendar Year 1961

Project	Location	Expenditures
Mountain pine beetle	Rocky Mtns., Pacific States	$1,128,600
Engelmann spruce beetle	Rocky Mountains	557,500
Western pine beetle and *Ips* spp.	Pacific States	463,200
Southern pine beetle	South and Southeast	247,600
Black Hills beetle	Rocky Mtns. and South Dakota	122,300
Black turpentine beetle	South and Southeast	109,400
Spruce budworm	Minnesota and Maine	100,100
Lodgepole needle miner	California	53,800
Elm spanworm	North Carolina, Georgia	35,000
Miscellaneous insects	Countrywide	190,800
	Total	$3,008,300

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Infestations of MOUNTAIN PINE BEETLE (*Dendroctonus monticolae*) were aggressive and relatively large in western white pine on the Gifford Pinchot and Wenatchee National Forests and in the Olympic National Park in WASHINGTON. Increased infestations occurred on this host in the Willamette and Mount Hood National Forests of OREGON. In lodgepole pine, outbreaks continued to increase moderately in Oregon forests and decline in Washington forests. The largest increase occurred in Oregon on the Fremont and Winema (former Klamath Indian Reservation) National Forests. Elsewhere, moderate increases were noted. An infestation of mountain pine beetle in Crater Lake National Park increased, but at a reduced rate. Infestations of mountain pine beetle in stagnated, pole-sized ponderosa pine stands increased slightly in Oregon and Washington. The largest centers of damage occurred on the Wallowa-Whitman National Forest in Oregon. In general, the trend of the mountain pine beetle infestations is upward in varying degrees for all species in the two-state area. Maintenance control was carried out in several lodgepole pine stands in Crater Lake National Park, Oregon. Thinning of dense ponderosa pine pole stands will relieve stand pressure which is the underlying cause attracting the beetles.

There were no major outbreaks of mountain pine beetle in CALIFORNIA and tree-killing of significant proportions occurred only at a few locations. A great many lodgepole pines were killed in the Warner Mountains and at Glass Mountain and Medicine Lake, Modoc County. Elsewhere in California, there was a noticeable reduction in the rate of loss in lodgepole pine, including Tuolumne Meadows, Yosemite National Park. The trend of mountain pine beetle infestations in sugar pines in California was upward in the southern Sierra Nevadas, and group-killing of mature trees occurred at Yosemite and Sequoia-Kings Canyon National Parks and the Tule Indian Reservation. Group-killing in second-growth sugar pines also occurred at two other locations in Madera and Tulare Counties. Infestations in ponderosa pine were reported only in Modoc County. At that location, two small outbreaks occurred in second-growth stands.

Mountain pine beetle infestations in old-growth western white pine continued to be a problem in northern IDAHO and western MONTANA. A recently completed survey of 41,000 acres of white pine type in the Clearwater National Forest, Idaho, showed the loss of timber from the beetle to be approximately 15.5 million feet, board measure, in 1960, and 13.2 million feet in 1961. This infestation has persisted for a long period. Data taken in 1938, and compared with the current survey results, show that the loss of mature timber has been 40 percent of the stand during the past 24 years. In Montana, remnants of older infestations of the beetle persist in lodgepole pine at Kintla Lake and in the Park Creek drainage in Glacier National Park.

There was an explosive increase in populations of moutain pine beetle throughout lodgepole pine forests in the Intermountain States, and more than 600,000 trees were attacked in 57 infestation centers in northern UTAH, western WYOMING and southeastern IDAHO. Large-scale projects to suppress the severe outbreaks were continued or initiated in affected areas during the year. Additional ones will be needed in 1962 to avert wholesale tree-killing over extensive areas. The major control project in 1961 was on the Wasatch National Forest, Utah. Here, some 135,000 infested trees were treated during the spring and summer and 32,000 more were treated in the fall. Approximately 252,000 newly infested trees will require treatment in 1962. Suppression of infestations also was undertaken on the Ashley National Forest, Utah; the Teton National Forest and Grand Teton National Park, Wyoming; and on the Targhee, Cache and Sawtooth National Forests, Idaho. Infestations of mountain pine beetle in ponderosa pine occurred in second-growth stands at two locations in the Intermountain States; one in the vicinity of McCall, Idaho, and the other at Crystal Bay on the northern shore of Lake Tahoe, NEVADA. There was no direct control in either area.

Mountain pine beetle infestations in stands of lodgepole and limber pine on portions of the Shoshone National Forest, WYOMING, were much reduced from conditions reported there in 1960. There was one small outbreak, however, northwest of Dubois, Wyoming, where an estimated 1,200 lodgepole pines were killed.

ENGELMANN SPRUCE BEETLE (*Dendroctonus engelmanni*) infestations increased slightly in both OREGON and WASHINGTON, but remain well below the critical level. The bulk of the damage in Washington occurred along stream bottoms on the Wenatchee National Forest. All of the epidemic outbreaks in Oregon occurred on the Wallowa-Whitman National Forest. All infestations are in isolated stands, with little danger of spreading. In MONTANA, a few outbreak centers occurred in, and adjacent to, cutover areas in Engelmann spruce stands. Most of the outbreaks were due to population increases in blowdown trees on the periphery of clear-cut blocks. Logging of infested trees for control was continued on the Kaniksu, Kootenai and Flathead National Forests in that State.

Infestations of Engelmann spruce beetle were less numerous and less severe in the Intermountain States than for the past several years. Small outbreak centers occurred, however, on the Dixie and Manti-La Sal National Forests, UTAH; the Boise National Forest, IDAHO; and on the Bridger National Forest, WYOMING. The largest of these outbreaks, on the Green River District, Bridger National Forest, was materially reduced by direct control in 1961. The infested trees remaining in this site are to be logged and follow-up treatment during the summer months should reduce infestations to endemic levels. Engelmann spruce beetle was abundant in the mature and overmature stands of Engelmann spruce in COLORADO, particularly in areas adjacent to recent cuttings. Two new outbreaks, both adjacent to logged areas, were discovered in 1961; one, on the Alpine Plateau, Grand Mesa-Uncompahgre National Forest, killed approximately 14,500 trees; the second, at West Crow Creek, Rio Grande National Forest,killed about 8,000 trees. The outbreaks of Engelmann spruce beetle reported in 1960 on the San Juan National Forest were suppressed by trapping the newly emerged beetles in felled green spruce trees. In all, a total of 16,000 spruce trees was felled in the trapping-for-control program, all of which were later salvaged.

Two serious Engelmann spruce beetle outbreaks developed in mature spruce stands in northern NEW MEXICO during the past several years. Both outbreaks originated in logging debris in adjacent areas. The outbreak on the Tierra Amarilla Grant near Chama, New Mexico, exploded in 1961 and has killed fifty percent or more of the spruce on 8,000 acres. The 10,000-acre outbreak on the Rio Grande Grant (now part of the Carson National Forest) and adjacent Carson National Forest near Taos, New Mexico, remained static. An estimated 95,560 1960 attacks and 81,680 1961 attacks occurred on about 3,500 acres. Suppression of the latter outbreak by logging infested stems and piling and burning infested cull material is in progress.

DOUGLAS-FIR BEETLE (*Dendroctonus pseudotsugae*) infestations in WASHINGTON, especially the recent extensive outbreaks on the Okanogan National Forest and Colville Indian Reservation, subsided. The anticipated flareup of infestation following the extensive blowdown in western Washington in 1958 did not materialize due to a concerted effort to salvage the blowdown and infested trees. The widespread outbreak in southwestern OREGON collapsed. The outbreak of Douglas-fir beetle on the Umatilla and Wallowa-Whitman National Forests in Oregon remained more or less static. The trend of infestation is variable with the locality. Direct control is not needed in 1962. However, infested trees are being salvaged to reduce the insect populations and utilize the timber before it deteriorates. No significant infestations of Douglas-fir beetle were reported in CALIFORNIA. Prompt action in salvaging blowdown timber in Siskiyou County averted possible outbreaks in that area. Activity of the beetle is currently at a low point in MONTANA and northern IDAHO and but 3 small epidemic infestations are present in the area. However, Douglas-fir beetle was abundant throughout southern Idaho, western WYOMING and UTAH. Douglas-fir stands on the Sawtooth National Forest in Idaho and on the Dixie National Forest in Utah were particularly hard hit. Tree-killing in these areas is expected to continue at the same high level in 1962. Logging infested trees is the only practical means of control and this effort is hampered by lack of access to the affected stands. Low endemic infestations of Douglas-fir beetle prevailed in all stands of Douglas-fir in eastern WYOMING and COLORADO, but tree-killing by this insect continued at a high level throughout the Douglas-fir stands in ARIZONA and NEW MEXICO. Salvage logging for control is being done in accessible areas in the latter two States.

WESTERN PINE BEETLE (*Dendroctonus brevicomis*) outbreaks declined on most areas in WASHINGTON and northern OREGON. In central and southern Oregon, however, outbreaks increased, particularly on the Fremont, Ochoco, Malheur and Rogue River National Forests. The killing of more single trees and small groups of trees in 1961 indicates a possible increase in tree-killing on local areas in 1962. Control of an outbreak on the Fremont National Forest was begun with the removal of infested trees and through an aggressive sanitation-salvage program. Sanitation-salvage operations are being stepped up at other active centers of infestations on other forests to reduce beetle populations and reduce hazards. Tree-killing by western pine beetle varied in intensity throughout CALIFORNIA. In the central and southern Sierra Nevadas, losses were heavy in second-growth stands of ponderosa pine, particularly in the foothill pine belt below 5,000 feet elevation. Local outbreaks in virgin ponderosa pines occurred at three locations in northeastern California and at Yosemite and Sequoia-Kings Canyon National Parks. Coulter and ponderosa pines were killed extensively in the recreational forests of southern California. In the latter areas, trees were more vulnerable to attack than elsewhere due to extreme deficiencies in annual precipitation. Western pine beetle was more active in the Northern Rocky Mountain States than in recent years. Small groups of infested ponderosa pines were common in the Nezperce National Forest, IDAHO. Thousands of acres have groups of red-topped trees attacked by this beetle in the lower tree boles and several species of *Ips* in the tops. The area of infestation extends from Riggins to Kooskia, Idaho.

BLACK HILLS BEETLE (*Dendroctonus ponderosae*) populations in stands of ponderosa pine in southern UTAH have shown a definite downward trend for the past several years. This trend continued in 1961. However, the beetle continued in outbreak status in ponderosa pine along the Front Range of the central Rocky Mountains. In comparison with 1960, there was a three-fold increase in numbers of trees killed. The most serious outbreaks occurred on portions of the Pike and

Roosevelt National Forests and adjacent private lands in COLORADO. Others, of lesser magnitude, occurred on parts of the Bighorn National Forest and adjacent lands in WYOMING and the Black Hills National Forest in SOUTH DAKOTA. It is estimated that 53,000 infested trees will need to be treated in all affected stands by July 1962 in the Central Rocky Mountain States, to reduce outbreak populations to endemic levels. In NEW MEXICO, a small infestation of Black Hills beetle killed limber pine on a portion of the Cibola National Forest. This persistent infestation in ponderosa pine on the Tres Piedras District, Carson National Forest, declined and became so scattered that direct control will not be needed in 1962.

ALASKA SPRUCE BEETLE (Dendroctonus borealis) continued to cause serious tree mortality in stands of white spruce south of the Alaska Range in ALASKA. Several local outbreaks occurred in the area between Cook Inlet and the Cooper River,and tree losses continued high on the Chugach National Forest and the Kenai National Moose Range. Infestations by JEFFREY PINE BEETLE (D. jeffreyi) in stands of Jeffrey pine were spotty in CALIFORNIA. Significant outbreaks occurred at two locations in northeastern California and in the Lower Deadman area of Inyo County. In southern California, tree-killing was centered around Bear Valley and the Upper Santa Ana drainage, San Bernardino County. Also in California, RED TURPENTINE BEETLE (D. valens) was particularly abundant statewide. All species of pines were attacked and many otherwise uninfested trees were killed.

The SOUTHERN PINE BEETLE (Dendroctonus frontalis) epidemic in southeastern TEXAS continued in 1961 and no relief is indicated for 1962. As of November 1961, 961 spot infestations had been mapped by aerial observers in Liberty, Harden, Tyler and Polk Counties. The spot infestations ranged from about one-quarter acre to 640 acres in size, the larger ones consisting of several thousand infested trees. Early summer rains hampered control crews in Texas and an estimated 80,000 infested trees occurred in outbreak areas at year end. There were new southern pine beetle outbreaks of serious proportions on the Homochitto National Forest, southeast MISSISSIPPI; and a two to ten-fold increase in number of trees killed occurred on the Talladega National Forest in ALABAMA. The infestations increased rapidly on the Homochitto National Forest from July to October and those on the Talladega National Forest increased despite prompt and concerted efforts to suppress them. Infestations of southern pine beetle continued at epidemic levels on the General Pickens Ranger District, Sumter National Forest, SOUTH CAROLINA, and adjacent private lands. In that area, tree-killing was severe on a gross area of approximately 100,000 acres. In GEORGIA, there were outbreaks of this beetle at scattered locations on four of the Ranger Districts on the Chattahoochee National Forest.

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) continued its activity on National Forest and private lands following logging and other operations in the Southern States. Populations were generally lower in 1961 than in the past two years in this part of the country, primarily due to a general decrease in logging activity, favorable moisture and widespread control operations. In low areas, particularly in the Gulf States, which were logged by heavy equipment under wet conditions, heavier losses occurred. Populations were extremely high in low areas where pine poles, sawtimber, pulpwood and hardwood were removed in four successive operations. Beetle activity also increased in naval stores areas in southern ALABAMA and southern GEORGIA, especially where trees were tapped for the first time. Black turpentine beetle occurred in small numbers at isolated locations in MISSOURI.

An infestation of ROUNDHEADED PINE BEETLE (Dendroctonus convexifrons) appeared on ponderosa pine around Bonito Lake, Lincoln National Forest, NEW MEXICO. This lake is a vital source of water for the city of Alamogordo. Approximately 700 trees were treated in August and 1,500 more trees will need to be treated in 1962 to suppress the outbreak.

PINE ENGRAVERS (*Ips* spp.) were reported as endemic throughout the spruce stands of interior ALASKA. The recent small outbreak along the Gerstle River, near Fairbanks, subsided from natural causes. These beetles were associated with most of the outbreaks of western pine beetle in the central and southern Sierra Nevadas and in southern CALIFORNIA. Attacking alone, they killed large numbers of Coulter and Jeffrey pines in the latter area of the State. The most explosive outbreaks in California occurred at Tanbark, Los Angeles County, in late September and early October. Here, about 25 percent of all the pines surviving the 1960 fire were killed. An unusually long activity period in 1961 appeared to favor *Ips* infestations in the Northern Rocky Mountain States. In the Nezperce National Forest, IDAHO, several species, including *I. oregonis*, *I. plastographus* and *I. interpunctus*, attacked ponderosa pines in groups of varying sizes up to 800 trees. The attacked trees ranged in size from 4 to 12 inches in diameter, breast high. In MONTANA, *I. ponderosae*, developing in slash and snow-damaged ponderosa pines, became epidemic. An area of about 130,000 acres in the Crow and Northern Cheyenne Indian Reservations was heavily infested. Groups of 100 or more immature trees were killed at many places. Larger trees were also attacked and killed, but in smaller numbers. In OREGON and WASHINGTON, the size and intensity of *I. oregonis* infestations in young ponderosa pine decreased; however, subepidemic damage was sustained in most ponderosa pine sapling stands throughout the area. Indications are that this species of *Ips* will be heavier during 1962 in scorched trees around recent burns. Because outbreaks of this insect develop and subside so rapidly, it is better to prevent buildups by management practices rather than to attempt suppression by direct means. In western SOUTH DAKOTA, a deficiency of precipitation favored a buildup of *I. oregonis*; and large numbers of ponderosa pines were killed and many others top-killed along the south and west edges of the Black Hills. Many of the killed trees were later infested by Black Hills beetle.

The infestation of CALIFORNIA FIVE-SPINED IPS (*Ips confusus*) declined in stands of pinyon pine adjacent to Walnut Canyon National Monument, ARIZONA. The beetle population remained above normal, however, posing a threat to the monument in 1962. This outbreak originated in pinyon pine labeled for range improvement. The beetles multiplied in the debris, then attacked and killed standing trees. Also in Arizona, infestations of *I. lecontei* declined slightly in standing ponderosa pines on the Prescott National Forest. A fall examination on the forest revealed that the population of this engraver was extremely high in logging slash and this could lead to renewed tree-killing.

In western ARKANSAS, a series of tornadoes and windstorms blew down several million board feet of shortleaf pine timber during the spring. Rapid salvage and weather conditions unfavorable for brood development prevented what could have been a serious outbreak of *Ips* spp. The beetles did increase as a result of this damage but not sufficiently to cause alarm. Infestations of *Ips* spp. in other parts of the Southern and Southeastern States were generally limited to trees struck by lightning, damaged by saltwater in the overflow from oil wells, or otherwise weakened. *I. avulsus* was often found associated with the southern pine beetle in southeast TEXAS and ALABAMA, making it difficult at times to determine which was the primary tree-killer. There has also been some indication of increase in *Ips* spp. activity in southern FLORIDA in trees weakened by the 1959-1960 hurricanes.

The 1960 outbreaks of a CEDAR BARK BEETLE (*Phloeosinus squamosus*) in scrub stands of Alaska cedar and western redcedar on Kuiu and Kupreanof Islands in southeast ALASKA declined.

FIR ENGRAVER (*Scolytus ventralis*) infestations in grand fir and subalpine fir stands increased moderately in both OREGON and WASHINGTON. The largest and most severe centers occurred on the Ochoco, Fremont and Umatilla National Forests, Oregon. In southern Oregon, a combination of root rot fungi and fir engraver caused some light mortality in Shasta red fir stands. Most of the losses caused by this insect are relatively unimportant because much of the damage occurred in defective, overmature grand fir and subalpine fir stands of low value. The infestation trend is slightly upward. No control is needed in 1962 because most infestations are in small, isolated stands, many of which are in inaccessible areas. Fir engraver killed large numbers of red and white fir at many locations in CALIFORNIA and the volume of timber destroyed exceeded that caused by any other of the major pest species. Tree mortality was most severe in the Warner Mountains, Modoc County, in Lassen County, and throughout the central and southern Sierra Nevadas.

Fir engraver is a chronic pest of true firs in the northern Rocky Mountains. In 1961, large areas of subalpine fir were killed in MONTANA. Most of the damage, however, occurred where the commercial value of killed trees is low. Early in the season, a small project was undertaken to suppress a fir engraver infestation in a large public campground. In the Clearwater National Forest, IDAHO, about 100 infested trees were logged in a management area in an effort to suppress an outbreak. This work is still in progress. The three-year-old fir engraver outbreak in white fir on the Lincoln National Forest, NEW MEXICO, and adjoining Mescalero Indian Reservation ended abruptly. The eleven-year-old outbreak in the Sandia Mountains, Albuquerque, New Mexico, continued to decline, but tree-killing is still severe on 5,000 acres. A parasitic fungus of the fir engraver, Aspergillus parasiticus, may have caused the decline. Three other infestations of this engraver, approximately 600 acres each, two in ARIZONA and the other in New Mexico, remained static.

Fir engraver and WESTERN BALSAM BARK BEETLE (Dryocoetes confusus) kill many thousands of true firs each year throughout the Intermountain States (UTAH, NEVADA, southern IDAHO, western WYOMING). The majority of the affected stands are in rather inaccessible areas and have relatively low economic value; thus control of infestations is rarely undertaken, except in high-value recreational areas. Infestations of western balsam bark beetle in subalpine fir stands in COLORADO were little changed from conditions in 1960. In some locations of that State, there was an increase in the rate of tree-killing. However, the trend was downward in most areas. Western balsam bark beetle continued to take a high toll of corkbark and subalpine firs in northern NEW MEXICO. Tree mortality was particularly severe on 40,000 acres near Red River, Carson National Forest.

DOUGLAS-FIR ENGRAVER (Scolytus unispinosus) outbreaks occurred in young Douglas-fir stands on dry sites on the Kaniksu and Colville National Forests in WASHINGTON. No damage was detected in OREGON. Infestations generally develop during dry years and return to normal when growing conditions improve. Also in Oregon and Washington, epidemic infestations of the SCOLYTIDS (Pseudohylesinus spp.) increased slightly in Pacific silver fir stands in both States. However, damage remains well below the levels experienced during the serious 1951-1955 outbreak. No direct control measures have been developed against these insects. Salvage of the infested and dead trees is the only practical solution.

CALIFORNIA FLATHEADED BORER (Melanophila californica) contributed to the death of ponderosa and Jeffrey pines in many areas throughout CALIFORNIA. Significant damage was caused to Jeffrey pines in the southern part of that State. Also in California, M. gentilis caused scattered local damage to sugar pines in the central Sierra Nevadas and FLATHEADED FIR BORER (M. drummondi) damaged Douglas-fir on the drier sites in the same general area; and ROUNDHEADED FIR BORER (Tetropium abietis), which is normally considered a secondary pest of true firs, caused heavy mortality in red fir infested with dwarfmistletoe and Cytospora sp. canker. Tree-killing by this fir borer in California was estimated at 3,000 board feet per acre on about 15,000 acres in the vicinity of Dry Lake, Siskiyou County.

WHITE-PINE WEEVIL (Pissodes strobi) was abundant throughout the northern parts of MICHIGAN, WISCONSIN and MINNESOTA on open-growing white, red and jack pines and Norway spruce. The damage caused by the weevil is severe each year and thus it is judged to be one of the most serious forest insects in the Lake States. The weevil continued to inflict serious damage to white pine, Norway spruce and other conifers in the Northeastern States in 1961. As usual, damage to host trees was most severe in plantations and other similar open-growing sites. Effective and economic control of white-pine weevil has been difficult to attain in the Northeast. However, the leader drench method of spraying is proving effective and economical and is strongly recommended. Suppression by spraying from aircraft and mistblowers has not proved consistently successful; however, further tests are underway. In MAINE, adults were present on leaders in Kennebec and Lincoln Counties by May 11. Larval injury to pine terminals became apparent in late June in RHODE ISLAND and damage was moderate in the Kingston area of Washington County.

SITKA-SPRUCE WEEVIL (Pissodes sitchensis) was recorded for the first time from San Juan County, WASHINGTON, during 1961.

PINE CHAFER (Anomala oblivia) - An outbreak of this species on two- or three-year-old loblolly pine plantations in Columbus County, NORTH CAROLINA, declined in 1961 after three years of heavy damage. The population decline was attributed to abnormal moisture conditions at the time the larvae were in the soil. TEN-LINED JUNE BEETLE (Polyphylla decemlineata) larvae damaged approximately 2 million Douglas-fir seedlings in a Lane County, OREGON, planting, with most damage occurring before August. Also in Oregon, ROOT WEEVILS (Brachyrhinus spp.) severely damaged 50,000 Douglas-fir seedlings in a Marion County planting during the summer.

COLUMBIAN TIMBER BEETLE (Corthylus columbianus) was discovered in 6 more INDIANA counties during the 1961 season. The addition of Orange, Rush, Ripley, Washington, Perry and Jackson Counties indicates a nearly complete distribution in the southern half of the State. The development of this beetle and its associated fungi in vigorous hosts results in excavations and dark staining in soft maple and is highly important, economically.

PINE REPRODUCTION WEEVIL (Cylindrocopturus eatoni) was particularly abundant in low elevation ponderosa pine plantations and natural reproduction in Tuolumne County, CALIFORNIA. Numbers of trees killed in natural stands were the highest on record.

SEED and CONE INSECTS took a heavy toll of the light to moderate seed and cone crop on most commercial coniferous tree species in CALIFORNIA. The very light cone crop of sugar pine was almost completely destroyed by SUGAR-PINE CONE BEETLE (Conophthorus lambertianae). Two species of CONE MOTHS (Dioryctria abietella and Barbara colfaxiana), together with a MIDGE (Contarinia sp.), caused considerable damage to a light crop of Douglas-fir cones. SEED CHALCIDS (Megastigmus spp.) and SEED MAGGOTS (Earomyia spp.) caused heavy damage to a light crop of cones in white and red fir. Undetermined species of CONE INSECTS heavily infested sampled cones of Douglas-fir in Island and San Juan Counties, WASHINGTON, during 1961.

ALDER FLEA BEETLE (Altica ambiens) populations were heavy in CALIFORNIA and they defoliated many native alder stands. Also in California, a WEEVIL (Angronus cinerarius) was damaging to white fir in the vicinity of Lake Tahoe; a new pest of white fir in that State.

SPRUCE BUDWORM (Choristoneura fumiferana) outbreaks in stands of Douglas-fir and true firs on the Fremont National Forest, OREGON, decreased in size and intensity due to the action of insect parasites and disease in 1961. Epidemic infestations in the Blue Mountain region on the Wallowa-Whitman National Forest, also in Oregon, subsided completely. Infestations on the Yakima Indian Reservation and private lands on the Glenwood District in southern WASHINGTON increased considerably in extent and severity in 1961, and higher populations are forecast for 1962. The 1961 egg mass evaluation survey indicated that the downward trend on the Fremont National Forest (Oregon) will continue, except on one small area. The Yakima Indian Reservation-Glenwood District (Washington) infestation trend is expected to continue strongly upward. Defoliation in the latter area has reached a critical stage and some top-killing is in progress. Aerial spraying will be necessary in 1962 to protect timber values. Elsewhere in Oregon and Washington, suppression is unnecessary. In CALIFORNIA, the long-standing infestation of spruce budworm in stands of white fir in the Warner Mountains, Modoc County, declined. Damage to affected host trees was insignificant. Foliar damage by spruce budworm increased in severity in Douglas-fir stands in the northern half of the outbreak area in MONTANA. Infested acreage remained at approximately 4.5 million acres and is not expected to increase in size. Egg masses were twice as numerous in 1961 as in 1960 -- indicative of heavy defoliation in 1962. There was no indication of a decline in the budworm outbreak that has remained epidemic in that area of the northern Rocky Mountain States for 14 years.

A widespread increase in scope and severity of spruce budworm infestations occurred in southern IDAHO during 1961. The 1.4 million acres of Douglas-fir and true fir infested represents a 275 percent increase in acreage affected over 1960. Damage levels in 1961 also were much higher than in 1960, with 800,000 acres sustaining medium or heavy defoliation. The increasing trend of spruce budworm infestations is expected to continue unless populations are reduced by direct means. In COLORADO, the acreage of spruce budworm infestations in the true fir and Douglas-fir forests increased 13 percent over that infested in 1960. New outbreaks discovered on the Arapaho, Roosevelt and Routt National Forests, when coupled with those previously known on the Rio Grande, San Juan and Pike National Forests, extended over a total area of 589,200 acres. The severity of defoliation also increased in 1961, causing heavy tree mortality, particularly in the understory, on the Rio Grande, San Juan and Pike Forests. Heavy defoliation and an increase in tree-killing is predicted for all infested areas of Colorado in 1962 unless budworm populations are reduced by direct means. Spruce budworm outbreaks in mixed conifer forests in northern NEW MEXICO encompassed over a million acres in 1961 -- an increase of about 350,000 acres over 1960. Most of this increase was on private land east of Eagle Nest, New Mexico. Infestation intensity increased in most areas, except on the western division of Sante Fe National Forest, where a decline was noted. The 1961 egg mass survey indicated that the downward trend in the western division of the Sante Fe National Forest will continue, but infestations in all other areas of the State will remain static or increase slightly. In these areas, tree-killing, especially on the understory, and top-killing will increase because of the accumulated effect yearly budworm feeding has on its host.

Defoliation of spruce-fir timber by spruce budworm was more severe on a larger area in northern MINNESOTA than in 1960. Top-killing and tree mortality also increased throughout the 240,000 acres classed as severely defoliated. The area of moderate to heavy defoliation spread east and southeast. Approximately 13,000 acres of the most damaging infestations in Koochiching County were treated by the State to avert wholesale tree-killing. The suppression project was highly successful. Larval populations were reduced by approximately 97 percent. Significant infestations of spruce budworm remained confined to northern MAINE in the Northeastern States, where damaging populations have been suppressed annually since 1954 to prevent catastrophic outbreaks. Suppression in 1961 involved treating 53,000 acres of balsam fir in northern Aroostook County, and post-suppression evaluation revealed a 98 percent reduction in budworm populations. State fish and game biologists found no serious damage to wildlife in the treated area. Spruce budworm surveys in Maine during 1961 showed that poor spring weather had not adversely affected budworm larvae, parasitism remained discouragingly low and egg masses were numerous enough to cause heavy defoliation on about 80,000 acres in 1962. Evaluation of damage to host trees in the infestation area resulted in decision by forestry officials of Maine against suppression in 1962.

LARGE ASPEN TORTRIX (Choristoneura conflictana), first recorded in outbreak numbers in CALIFORNIA in Modoc County in 1960, continued at a high level and expanded into adjacent areas. Heavy defoliation of host trees occurred on approximately 3,500 acres.

JACK-PINE BUDWORM (Choristoneura pinus) defoliated jack pines in varying degree ranging from light to heavy on some 150,000 acres in parts of MICHIGAN, WISCONSIN and MINNESOTA. The most serious infestations, those on approximately 40,000 acres of public and private lands in Wisconsin, were suppressed by aerial treatments. The bulk of the infested acreage was on non-Federal lands and was treated by the State of Wisconsin. Population reduction ranging upward from 78 percent was considered satisfactory.

Infestations of BLACK-HEADED BUDWORM (Acleris variana) in the hemlock-spruce forests of southeast ALASKA were little changed from conditions in 1960. South of Frederick Sound, larval populations were generally light. North of the Sound, however, and at Rodman Bay and Sitkoh Bay on Baranof and Chichagof Islands, respectively, larval populations were heavy. Parasite enemies of the budworm were relatively scarce in 1961. There was a marked increase in egg deposition by adult female moths during the year in Alaska. Thus, the combination of favorable weather during 1961, low numbers of parasites, and an increase in egg deposition point to a probable increase in the black-headed budworm population in 1962. Sizeable infestations of black-headed budworm causing light defoliation developed on the Olympic and Snoqualmie National Forests in WASHINGTON. Pacific silver fir and western hemlock were the species attacked. The trend of these infestations is undetermined. Most outbreaks of the insect in OREGON and Washington have subsided within a year or two without causing appreciable damage.

SPRUCE BUD MOTH (Zeiraphera ratzeburgiana) outbreaks of light to moderate intensity occurred in young Sitka spruce stands at several locations on the west side of the Olympic Peninsula, WASHINGTON. Such outbreaks usually subside quickly without causing serious damage to the stands. Another BUD MOTH (Z. griseana) infested an estimated 250,000 acres of western larch in MONTANA during 1955-1957. Later, the outbreaks subsided and no areas of infestation were again observed until 1961. About 500 acres of larch were heavily infested near Tony Peak, Kootenai National Forest, Montana.

LARCH CASEBEARER (Coleophora laricella) was first discovered in the West during the summer of 1957 near St. Maries, IDAHO. When the discovery was made, at least 15,000 acres of western larch host type showed visible defoliation. When the first comprehensive survey was made in 1958, the casebearer was found established in larch stands over a 4,000 square mile area. By 1961, the insect had spread to larch stands in an area of 9,000 square miles. Visible damage seen from the air covers 700 square miles. An attempt to establish biological control in Idaho was undertaken in 1960. Shipments of a braconid parasite (Agathis pumilus) from the Northeastern States were liberated in the infested area. Plans are to intensify biological control in 1962 by liberating larger numbers of parasites and by trying to establish a local source of them for wider distribution. In MAINE, moderate populations of BIRCH CASEBEARER (Coleophora salmani) caused light damage to white birch in northeastern Aroostook County by June 15.

Localized outbreaks of DOUGLAS-FIR TUSSOCK MOTH (Hemerocampa pseudotsugata) occurred in Moscow, Clarks Fork and Bonners Ferry, IDAHO. Several species of fir and spruce were infested. Isolated groups of infested trees were found in a 20-mile area near Bonners Ferry, mostly in farm woodlots. Some owners treated with insecticides to control the pest. Small, localized infestations of the tussock moth occurred on occasion west and south of Denver, COLORADO. One such infestation occurred in 1961 and Colorado blue spruce, planted in the area as ornamentals, were severely defoliated. The tops of the infested trees were killed. Outbreak proportions of the Douglas-fir tussock moth continued in white fir and Douglas-fir in several box canyons on Sandia Mountain near Albuquerque, NEW MEXICO. The area is inaccessible to aerial treatment, thus no effort was made in control.

SILVER-SPOTTED TIGER MOTH (Halisidota argentata) was moderate to heavy on Douglas-fir in Kitsap and San Juan Counties, WASHINGTON, during March and April.

After a 10-year absence, WESTERN HEMLOCK LOOPER (Lambdina fiscellaria lugubrosa) reappeared in epidemic numbers in western OREGON. Sizeable areas of light to heavy defoliation occurred in mixed stands of mature and immature western hemlock in the vicinity of Astoria. Some mortality has already occurred in localized areas and other valuable stands are threatened. Unless the overwintering egg population is drastically reduced by natural factors, suppression will be needed in 1962 to protect the affected stands. Also in Oregon, WESTERN OAK LOOPER (L. fiscellaria somniaria) outbreaks on Oregon white oak near Dallas and Monmouth continued for a second year. Almost complete defoliation occurred early in the summer, but refoliation was noted when larval feeding was finished. In WASHINGTON, light to severe defoliation of Oregon white oak by western oak looper was reported near Chehalis and Olympia. Outbreaks of this insect generally subside without causing lasting damage; hence, control is usually unnecessary under forest conditions. In NEW JERSEY, a similar LOOPER (L. athasaria pellucidaria) was reported. Moths were numerous in the pine barrens of Atlantic and Ocean Counties in the summer; however, larval damage in the fall was not heavy.

An outbreak of a LARCH LOOPER (Semiothisa sexmaculata) occurred in western larch stands on the Colville National Forest, WASHINGTON, extending along the south side of the Columbia River from Northport to the Canadian line. The trend of the infestation is being determined. Control of this insect is usually unnecessary, since western larch can sustain considerable defoliation without being killed.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) has long caused serious damage to red pine in parts of CONNECTICUT, NEW JERSEY and PENNSYLVANIA, enough so as to discourage landowners from further planting that species of tree. Infestations in other of the Northeastern States caused damage of varying degrees. The insect appears to be increasing each year. A slight increase in populations of Europen pine shoot moth occurred in most of the infested red pine plantations in Lower MICHIGAN and southern WISCONSIN. There was no spread of infestations, however, and no new infestation discoveries. It is of interest to note that many of the pine plantations sustaining persistent infestations in these two States are outgrowing the effects of past attacks. The European pine shoot moth was reported from widely scattered locations in the Central States and infestations were similar to those in Lower Michigan and southern Wisconsin. European pine shoot moth was discovered in 7 new locations in WASHINGTON and OREGON during 1961. Quarantines have been established to prevent further spread of this insect in the Northwest. See CEIR 12 (14):316 for additional information on this pest in the Northwest and other parts of the country.

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) infestations were light in ILLINOIS and MISSOURI. In the South and Southeast, reports indicated that both Nantucket pine tip moth and PITCH-PINE TIP MOTH (R. rigidana) were present throughout pine-growing areas. In most instances, populations were less abundant than in previous years.

Numerous PANDORA MOTH (Coloradia pandora) adults were collected by light trapping in the Long Pines Division, Custer National Forest, MONTANA, but no visible evidence of defoliation occurred during the year. The expected damage to stands of lodgepole pine in northern UTAH infested by pandora moth failed to materialize in 1961. The larval population in all infested areas declined, primarily as a result of infection by a native polyhedrosis virus. First-year larvae of the moth were numerous in stands of lodgepole pine along the COLORADO-WYOMING border.

Defoliation of host trees was light, but heavy enough to be visible from low-flying aircraft. On the basis of aerial observations, it was estimated that 36,000 acres of host type were defoliated. Infestation spread has been northeastward within the Medicine Bow National Forest, Wyoming.

Sudden and severe infestations of PINE TUSSOCK MOTH (Dasychira plagiata) in stands of jack pine, red pine and white spruce occurred at several locations in the Lake States in 1961. The most severe outbreak, one which completely defoliated host trees, extended over some 3,500 acres in the General Andrews State Forest, MINNESOTA. The others, on Chippewa National Forest, Minnesota, and in portions of Douglas and Bayfield Counties, WISCONSIN, were more extensive but less severe. The infestations in Wisconsin totaled some 60,000 acres. It is predicted that heavier infestations will occur in 1962 in all areas.

LODGEPOLE NEEDLE MINER ("Recurvaria" milleri) infestations have increased in severity in the lodgepole pine forests of the Intermountain States since 1957. In 1961, some 200,000 acres were infested in varying degrees. Epidemic centers occurred at several locations in the Targhee and Caribou National Forests, IDAHO; the Bridger National Forest, WYOMING; and the Ashley National Forest, UTAH. Also, an outbreak of this needle miner was discovered in the Big Belt Mountains, Helena National Forest, MONTANA. About 4,500 acres of lodgepole pine were infested. Samples of foliage collected in the fall showed very few overwintering larvae. In CALIFORNIA, the long-standing outbreaks of lodgepole needle miner continued in the lodgepole pine forests in the southern Sierras. The most serious was in the Tuolumne River drainage, Yosemite National Park. However, aerial application of insecticides on approximately 5,000 acres of this infestation during the year greatly reduced populations in treated areas. The outbreaks at Sequoia-Kings Canyon National Parks and near Mineralking, Tulare County, were little changed from 1960. Damage to lodgepole pine by a closely related species continued heavy at Sentinal Meadows, Mono County.

A severe infestation of a PONDEROSA PINE NEEDLE MINER ("Recurvaria" moreonella) in ponderosa pine stands occurred on some 19,000 acres of the Ashley National Forest, UTAH. The infestation centers in the newly developed forest recreation area in vicinity of the Flaming Gorge Dam on the Green River. The needle miner infested only needles more than 3 years old; thus, trees were but partly defoliated. It was estimated that more than 80 percent of the stand was attacked. An outbreak of an unidentified PONDEROSA PINE NEEDLE MINER has been in progress for 4 years on the Warner District of the Fremont National Forest, OREGON. In 1960, the size and intensity of the infestation is potentially important in that the trees may be weakened, making them susceptible to western pine beetle attack from surrounding bark beetle infestations. Life history studies are being made so that control measures can be developed, if necessary. Suppression is not needed in 1962.

Populations of an ASPEN LEAF MINER (Phyllocnistis populiella), which have been reported in western WYOMING and eastern IDAHO for the past 10 to 13 years, continued to inflict extensive damage to aspen stands in 1961. Tree mortality, as a result of defoliation, became increasingly evident. There was no effort made to reduce populations by direct means.

A serious outbreak of WHITE-FIR NEEDLE MINER (Epinotia meritana) in stands of white fir in southern UTAH was suppressed in 1957 by aerial application of an insecticide. Heavy parasitism of the needle miner population at that time, within and without areas treated, also helped to suppress the outbreak. In 1960, an increase in population was observed in areas previously infested. The upward trend continued in 1961.

PINE NEEDLE MINER (Exoteleia pinifoliella) pupae were noted in Richmond area of Washington County, RHODE ISLAND, on June 28, and adults emerged the following week. A COTTONWOOD BLOTCH LEAF MINER (Paraleucoptera albella) damaged cottonwood trees in Phillips, Toole and Fergus Counties, MONTANA, and caused light damage to narrow leaf cottonwoods in the Sevier-Piute County area of UTAH. Undetermined LEAF MINERS conspicuously damaged quaking aspen foliage in several higher mountainous areas in the northern part of Utah, and an undetermined NEEDLE MINER was abundant on white fir in a portion of Modoc County, CALIFORNIA.

Ponderosa pine seedlings and brush species in the Boise Basin, Boise National Forest, IDAHO, have been severely defoliated by TUSSOCK MOTH (Orgyia spp.) larvae since 1959. Populations continued at epidemic levels in 1961 and two plantations, Town Creek and Clay Creek, required controls to save the valuable ponderosa pine seedlings. The tussock moth infestation in stands of white fir at Wheeler Peak, NEVADA, were endemic. Populations in this area were reduced materially in 1960 by aerial application of a polyhedrosis virus.

A TORTRICID (Argyrotaenia sp., tentatively determined as A. pinatubana) was found infesting approximately 100,000 acres of lodgepole pine near St. Anthony, IDAHO. The infestation was most severe in reproduction and young trees on cutover areas. There was no control undertaken and none may be needed. However, the infestation could cause widespread deformity of lodgepole reproduction, which in turn would impair the value of future sawlogs in the area.

An unidentified LEAF TIER caused from 75 to 100 percent defoliation of aspen in two areas of about 1,000 acres each in the southern area of UTAH. These two leaf tier outbreaks are the first reported infestations of this magnitude in the State.

Unidentified DEFOLIATORS caused heavy defoliation of white spruce in the vicinity of Kachemak Bay in Cook Inlet, ALASKA. The damage was similar to that caused by spruce budworm. Also, almost complete defoliation of alders occurred in high elevations on portions of the Chugach National Forest and along the east side of Susitna Valley, and paper birch at Harding Lake, near Fairbanks, was defoliated. None of the defoliating insects has yet been identified.

A PHYCITID (Dioryctria sp.) caused light damage similar to the pine tip moths in Houston County, TEXAS.

GYPSY MOTH (Porthetria dispar) was reported to have developed to major epidemic status in parts of New England and NEW YORK. State and Federal agencies cooperated in programs to suppress outbreak populations and prevent spread by treating approximately 165,000 acres. Trapping outside the generally infested area resulted in catches of male moths in parts of NEW JERSEY, PENNSYLVANIA, NEW YORK, VERMONT, NEW HAMPSHIRE and MAINE, indicating incipient infestations in those areas. In Maine, eggs hatched in hardwood stands in York, Cumberland, Oxford and Washington Counties by mid-May. Aerial control application was made May 17-20 on 1,700 acres in the southern part of the State and 200 acres in Cherryfield, Washington County. First pupation in Maine was observed in Bar Harbor area, Hancock County, July 8. Infestations and damage were heavy on hundreds of acres in the Waterboro-Lyman area of York County; infestations were heavy in T 10 SD, with central 1,000 acres heavily damaged; and moderate to heavy infestations occurred in T 24 MD-SW, with 800 acres damaged. These areas are west and north of Cherryfield, Washington County. All damage in Maine was on hardwoods. In Vermont, gypsy moth was prevalent in Addison County and the pest was abundant west of the Connecticut River in CONNECTICUT. Some 58,000 acres were heavily infested and 45,716 acres treated in that State. Noticeable defoliation was found on 15,775 acres in Connecticut, with 4,200 acres being defoliated 50 percent or more. In RHODE ISLAND, egg hatching was observed in Exeter area, Washington County, and Warwick area, Kent County, on May 15. In MICHIGAN, a survey was conducted from June 26 to September 1 of all previously known infested sites in Calhoun, Clinton, Eaton, Ingham, Ionia, Jackson and Shiawassee Counties. The area included 1,007,360 acres in 1,574 square miles and required 7,476 traps, which included 6 traps in Ottawa County. As a result of the survey, 2 moths were found in 2 traps in Onondaga Township, Ingham County.

LINDEN LOOPER (Erannis tiliaria) represents one of a group of problematical pests that may be referred to as "miscellaneous hardwood defoliators." When defoliation is noted, a complex of species is usually involved, with one or two predominating. Outbreaks are generally characterized by sudden population increase and rapid decline, with several years elapsing in an area before the same, or a different complex, causes heavy defoliation again. Because the linden looper is expected to be in major outbreak status on over 40,000 acres in CONNECTICUT in 1962, it is singled out for reporting here. In Connecticut in 1961, approximately 1,500 acres were treated to suppress a complex of about 4 species, predominantly CANKERWORMS. Noticeable defoliation was seen on 37,500 acres located west of the Connecticut River. A fall flight of male moths in the area indicates that the linden looper will reach epidemic status on a much larger acreage. At the same time, the cankerworms in the species complex may prove less severe. In NEW YORK, heavy adult flights of linden looper occurred in the Albany area of the Hudson Valley and part of Long Island during November. Cankerworms are expected to be troublesome in 1962 in New York.

ELM SPANWORM (Ennomos subsignarius) defoliation of oaks, hickories and other hardwoods in the tri-State area of GEORGIA, TENNESSEE and NORTH CAROLINA encompassed a gross area of 1,532,000 acres in 1961. This was a slight decrease over last year's gross area of 1,676,000 acres. However, there was a considerable increase in the acreage with moderate and heavy defoliation. The movement of the outbreak in 1961 continued to be in a northerly and easterly direction. An egg mass survey in September indicated a population decline over most of Tennessee, Georgia and southwestern North Carolina. Egg mass counts were high, however, in Macon and Graham Counties, North Carolina, and Rabun and Habersham Counties, Georgia. Moderate to heavy defoliation can be expected in these counties in 1962. Elm spanworm infestations were suppressed on a total of 7,850 acres of high value recreational and research areas on the Chattahoochee National Forest, Joyce Kilmer Memorial Forest and the Coweeta Hydrologic Laboratory in Macon County, North Carolina. Suppression was by helicopter application of an insecticide.

Epidemic populations of FALL CANKERWORM (Alsophila pometaria), on two small tracts near Hot Springs, NORTH CAROLINA, declined as a result of late spring frost.

FALL WEBWORM (Hyphantria cunea) is a serious defoliator of cottonwood, willow and other broad-leaved trees in ARIZONA and NEW MEXICO. Damage caused by this insect increased considerably at Aztec Ruins, Chaco Canyon and Bandelier National Monuments in New Mexico. Damage was common on various forest trees in eastern TEXAS during the year. Colonies of the pests were commonly seen feeding on sourwood, persimmon and other hardwoods during the late summer throughout the Piedmont and mountain section of NORTH CAROLINA. In some localities, individual trees were stripped of their foliage, but nowhere were extensive areas completely defoliated. High populations of fall webworm on roadside trees from MAINE to VIRGINIA and westward led to many reports of its unusual abundance in 1961. The esthetic value of affected trees in many locations likely will lead to some suppression effort in 1962 in the Northeastern States. Natural factors are expected to exert a controlling influence on webworm populations in the near future and outbreaks are not expected to continue beyond 1963 in that area of the country.

Moderate defoliation of hardwoods by FOREST TENT CATERPILLAR (Malacosoma disstria) occurred at many locations in the Northeastern States. With the exception of an increasing infestation in western MASSACHUSETTS, populations declined from levels that occurred in 1960. Forest tent caterpillar severely defoliated water tupelo, blackgum, sweetgum and other bottomland hardwoods over extensive areas in LOUISIANA and ALABAMA during the spring. In Louisiana, three areas totaling about 1,500,000 acres were completely defoliated. One, east of Alexandria, covered at least 300,000 acres. About 250,000 acres were defoliated just west of New Orleans and Lake Pontchartrain, and over one million acres were defoliated in the Atchafalaya Basin. Most of the latter two areas were also defoliated in 1960. In southern Alabama, along the Alabama River, complete defoliation occurred on an estimated 200,000 acres. This was an increase of 144,000 acres over 1960. An additional 450,000 acres were lightly defoliated in that State. Severe defoliation is expected to occur in all infested areas in both Alabama and Louisiana in 1962 unless natural factors, such as parasites and predators, intervene.

Two species of tent caterpillars, forest tent caterpillar and GREAT BASIN TENT CATERPILLAR (Malacosoma fragile), caused moderate defoliation of aspen, cottonwood and various browse plants in several areas throughout UTAH, western WYOMING, southern IDAHO and portions of NEVADA. However, it is noteworthy that infestations of Great Basin tent caterpillar in stands of aspen in southern COLORADO continued a downward trend in 1961. Infested patches of aspen were found only at scattered locations on the Gunnison and San Juan National Forests in the latter State. In NEW MEXICO, aspen on 100,000 acres in the northern part of the State was severely defoliated by Great Basin tent caterpillar. An infestation also increased on the Navajo Indian Reservation after several years of downward trend.

RED-HUMPED OAKWORM (Symmerista albifrons) completely defoliated northern hardwoods on a large aggregate acreage in Upper MICHIGAN and northern WISCONSIN. The outbreaks occurred in small, well-defined areas on a total of some 12,000 acres. Larval feeding was during late summer and early fall, thus it is likely that defoliated trees were not seriously damaged.

YELLOW-NECKED CATERPILLAR (Datana ministra), VARIABLE OAK LEAF CATERPILLAR (Heterocampa manteo), SPINY OAKWORM (Anisota stigma) and ORANGE-STRIPED OAKWORM (A. senatoria) were observed defoliating oaks in widely scattered areas throughout the hardwood areas of the Gulf States. In RHODE ISLAND, larval infestations of variable oak leaf caterpillar were present on oak in Exeter, Washington County, in mid-September and small, localized infestations of orange-striped oakworm developed in woodland areas of the State during early September. Also in Rhode Island, the first larval injury of a GEOMETRID (Calocalpe undulata) to wild cherry became apparent in South Kingstown, Washington County, at the end of July.

A PHYCITID (Euzophera ostricolorella) presents a serious problem in tulip-poplar timber trees in La Porte County, INDIANA. In May, a 100-percent infestation of this pest was present in three timber stands, totaling about 100 acres. This pest, previously known from states east and south of Indiana, has only recently become established in the State and poses a serious threat to the growing of this valuable tree. Later in 1961, this species was recovered for the first time in Dubois County in the southern portion of the State. Although the borer restricts its activities to the root collar region of trees of all sizes, it is causing great concern among foresters because excavations under the bark enhance the invasion of secondary pathogens and insects into the plant tissue. The infestations on these 2 extreme locations have been present for at least several years.

A FLANNEL MOTH (Megalopyge sp.) defoliated oak in areas of Edwards Plateau, TEXAS.

OAK SKELETONIZER (Bucculatrix ainsliella) caused extensive damage to oak woods throughout the northern third of INDIANA.

Two outbreaks of an unidentified GELECHIID MOTH occurred during 1961 in the northern Rocky Mountain States. Defoliation occurred in the terminals of lodgepole pine. In the Gallatin National Forest, MONTANA, 3,500 acres were infested. Samples of defoliated lodgepole pine were also received from Yellowstone National Park, WYOMING.

INTRODUCED PINE SAWFLY (Diprion similis) populations were light to moderate in MAINE; only light damage was noted on white pine in Topsfield, Washington County, on July 17. The sawfly declined in north central MINNESOTA and northwestern WISCONSIN as a result of natural factors. EUROPEAN SPRUCE SAWFLY (D. hercyniae) was common in eastern and central forest areas of MAINE in mid-July.

SAWFLIES (Neodiprion spp.) defoliated young ponderosa pine, white fir and Douglas-fir at scattered locations in CALIFORNIA; and a new infestation of Neodiprion sp. was found in ponderosa pine near Magdalena in western NEW MEXICO. Sawfly colonies per tree, in the latter State, were usually less than three and infested trees were scattered. The infestation in the Zuni Mountains, about 80 miles northwest of Magdalena, New Mexico, persisted on about 1,200 acres. Damage to host trees in that area was moderate. Hatch of Neodiprion spp. was about 2 weeks earlier than usual in southern VIRGINIA, beginning about March 6-7. Defoliation in the State was less than anticipated, based on winter egg survey, probably due to extended cool, wet spring, coupled with earlier hatching than usual. Infestations were general in Charlotte, Fairfax, Prince Edward, Nottoway, Amelia, Dinwiddie, Prince George and Brunswick Counties, Virginia. In NEW JERSEY, Neodiprion spp. were abundant locally in Ocean County in late April.

BALSAM-FIR SAWFLY (Neodiprion abietis) was common on fir in northern and eastern areas of MAINE during mid-July, and JACK-PINE SAWFLY (N. pratti banksianae) was noted in light numbers in stands of jack pine infested by jack-pine budworm on the Chippewa National Forest, MINNESOTA. EUROPEAN PINE SAWFLY (N. sertifer) increased slightly in red pine plantations in Lower MICHIGAN and caused especially heavy defoliation of pine trees in the northern third of INDIANA. The species is now rather generally distributed in the latter State.

RED-HEADED PINE SAWFLY (Neodiprion lecontei) was reported from a few locations in the Central States. The local outbreak in Lower MICHIGAN declined from natural factors. The sawfly defoliated 2,000 acres of 3- and 4-year-old loblolly pines in Columbus County, NORTH CAROLINA; feeding occurred in localized spots and, in some cases, individual trees were stripped of their foliage. Red-headed pine sawfly caused local damage in many VIRGINIA counties during 1961. Scattered infestations of the red-headed pine sawfly were damaging to red and Scotch pines, notably in plantations from NEW YORK southward to KENTUCKY, WEST VIRGINIA and Virginia. Damage ranged from light to very heavy, with killing of small groups of trees in some places. The large number of small outbreaks of this and other sawfly species, over a wide geographical area in the Northeastern States, points to the need for early detection and prompt suppression to prevent damage and loss to affected stands.

A PINE SAWFLY (Neodiprion pratti pratti) outbreak on Virginia, pitch and shortleaf pines has occurred in extensive areas of MARYLAND, VIRGINIA and parts of NORTH CAROLINA for the past several years. The infestation persisted throughout the tri-State area in 1961, but was less severe than in 1960. Cool, wet weather adversely affected the larvae and the trend of the outbreaks is downward. In north central North Carolina, damage was noticeable on shortleaf and Virginia pines only in Granville, Vance, Durham, Orange and Franklin Counties. The sawfly was reported from only a few locations in the Central States.

HEMLOCK SAWFLY (Neodiprion tsugae) occurred only in light numbers in the forested areas of southeast ALASKA. Larval counts in sample areas were but 25-33 percent of those occurring in 1960 and eggs were absent in all collections. Extremely light populations are predicted for 1962. In north central MONTANA, N. nanulus contortae and N. fulviceps have seriously defoliated 6,000 acres of lodgepole and ponderosa pines since 1958. Larval forms of these species collected in 1961 died during rearing, of what was tentatively determined as a polyhedrosis virus. Later, field examinations indicated that the disease has reduced the larval populations in that area of Montana. The outlook for 1962 is for light defoliation in all areas. In NEVADA, an outbreak of N. edulicolus has persisted in stands of pinyon pine near Pioche for the past several years. During 1960, unseasoned snowstorms and low temperatures, combined with increased numbers of sawfly parasites, reduced the populations to a relatively low level in that area of Nevada. In 1961, the populations of N. edulicolus increased and affected trees were lightly defoliated. No effort was made to suppress populations by direct means and usually none is needed because affected stands are of low value. However, defoliation seriously curtails the harvest of pinyon pines from the area for use as Christmastrees. In ARKANSAS, N. taedae linearis defoliated approximately 50 acres of thinly stocked stands of loblolly pine.

YELLOW-HEADED SPRUCE SAWFLY (Pikonema alaskensis) infestations were moderate on white spruce in local areas of Indian Township, Washington County, MAINE, in mid-July.

The only known active infestation of LARCH SAWFLY (Pristiphora erichsonii) in northern IDAHO was in pole-sized stands of western larch in the Olsen Creek drainage, St. Joe National Forest. Approximately 1,100 acres were infested. However, epidemic numbers of larvae severely defoliated larch stands near McCall, Idaho. Pupal density in outbreak area was high. Laboratory rearings showed a high percentage of them was parasitized, thus the surviving population may be insufficient to cause noticeable defoliation in the McCall area in 1962. Larch stands in Upper MICHIGAN were severely defoliated in 1961.

A PINE SAWFLY (Zadiprion rohweri) varied from light to heavy on pinyon pine in Clark County, NEVADA, in late July and August. The heaviest infestations occurred between 4,000 and 5,000 feet, but trace numbers were found at 6,500 feet. Zadiprion sp. was present in light to very heavy numbers on the same host in Douglas, Lyon, Ormsby and Washoe Counties, Nevada, in August and early September. The degree and severity of infestations were the same as with the previous species, but at the lower elevations many trees were completely defoliated.

Several species of HORNTAILS (Sirex spp.) attacked white and red firs and incense cedars on several of the 1960 burns in Sierra and Placer Counties, CALIFORNIA. Lumber processed from the attacked trees was severely degraded as a result of the borer damage.

TEXAS LEAF-CUTTING ANT (Atta texana) defoliated young pine seedlings in west central LOUISIANA and other areas within its range.

BALSAM WOOLLY APHID (Chermes piceae) infestations in subalpine fir stands increased in size and intensity in OREGON. The largest and most severe outbreaks occurred on the Willamette National Forest. Mortality in Pacific silver fir and grand fir was at a very low level, except in a few local areas. The trend is strongly upward in subalpine fir, but variable in Pacific silver fir and grand fir. Direct control is impractical under forest conditions. For the past 5 years, efforts to establish colonies of foreign insect predators have been made with some success. Several species have become established and show some promise of reducing aphid populations. The balsam woolly aphid was detected on Fraser fir on Mt. Mitchell State Park, NORTH CAROLINA, in 1957. Surveys the following year indicated that the infestation was restricted to 7,100 acres of spruce-fir type in the Mt. Mitchell area. During 1961, increased mortality of the Fraser fir on Mt. Mitchell was noted. In addition, isolated infestations were found on shade trees in Avery, Burke and Yancey Counties, North Carolina. Aerial surveys in the fall of 1961 indicated that native spruce-fir stands on

Roan Mountain, Grandfather Mountain, the Great Smokey Mountains National Park and Richland Mountain were free from aphid attack. Balsam woolly aphid is generally distributed throughout stands of balsam fir in MAINE, NEW HAMPSHIRE, VERMONT and portions of NEW YORK. It is a serious pest in all of those areas, gouting and killing affected trees. The successful establishment of the predaceous beetle (Laricobius erichsonii) in aphid-infested stands in eastern Canada and in portions of Maine, prompted increased efforts in 1961 to effect biological control of the aphid in several New England locations. Colonies of 500 or more of the beetles, imported from Germany, were released on heavily infested firs at several places in Maine, Vermont and New Hampshire. In all, approximately 20,000 beetles were released at 20 separate locations.

COOLEY SPRUCE GALL APHID (Chermes cooleyi) was numerous and damaging to spruce in parts of the Dixie National Forest in UTAH.

The heaviest infestations of PINE LEAF APHID (Pineus pinifoliae) in the Northeastern States occurred in MAINE and NEW HAMPSHIRE. Spot infestations also occurred in NEW YORK and VERMONT. The accumulation of galls on red spruce was heavy in all infested areas. Aphid damage to white pine in eastern Maine, an area supporting a long-term heavy infestation, amounted to as much as 29 percent of the understory trees more than three feet tall, in mixed stands. Tree mortality in mixed stands was 15 times greater than in open stands. Migration from pine to spruce in Maine was at a peak in Washington County by June 20.

Various species of APHIDS were general on hardwoods throughout MAINE.

Nymphal populations of SARATOGA SPITTLEBUG (Aphrophora saratogensis) occurred in large numbers in many red pine plantations in northern WISCONSIN and Upper MICHIGAN. Infested plantations on a total of 3,500 acres were treated in late June and early July to avert damage to host trees by adults. It is anticipated that an additional 3,500 acres of plantations will need controls in those areas in 1962. Moderate infestations of PINE SPITTLEBUG (A. parallela) nymphs occurred on pitch pine in the Richmond area of Washington County, RHODE ISLAND, in late June.

A RED-PINE SCALE (Matsucoccus resinosae), which is a serious pest of red pine in the Bridgeport, CONNECTICUT, area, and on Long Island and Westchester County, NEW YORK, was found on a 160-acre watershed planting around the Wanagua Reservoir, NEW JERSEY, in 1960. New Jersey officials took vigorous steps in 1961 to eliminate the scale from the watershed planting and adjacent small areas -- the only known infestations in the State -- by destroying all host trees. New York and Connecticut also expanded detection programs and are destroying infested host trees to reduce scale spread. An effective method for control of the scale, short of elimination of host trees, is not known.

A COCCID (Matsucoccus acalyptus) killed hundreds of young pinyon pines in the Mineral Range Mountains of Beaver County, UTAH, and in foothill areas of western Iron County in the same State. In NEVADA, this same species was heavy on pinyon pines in many areas of Clark, Esmeralda and Lincoln Counties. The infestations are expected to persist in both States in 1962 and further defoliate affected trees. Infestations of M. acalyptus continued very heavy at Grand Canyon National Park, ARIZONA, and at Mesa Verde National Park, COLORADO. The coccid has caused limited tree mortality in these latter two areas. It assumes great economic importance in recreation areas of the Southwest where pinyon pine is often the only tree available for shade.

The killing of beech by BEECH SCALE (Cryptococcus fagi) and the Nectaria fungus complex continued in northern New England and NEW YORK. Populations of the scale increased in the more recently infested stands and there was spread to new areas. Nectaria commonly follows in the wake of beech scale infestations to complete the tree-killing process. Another SCALE INSECT (Xylococculus betulae) was common on beech on the eastern slopes of the White Mountains, NEW HAMPSHIRE.

PINE NEEDLE SCALE (Phenacaspis pinifoliae) caused considerable damage to young ponderosa pine pole stands in and near The Dalles, OREGON. Elsewhere in the pine region of Oregon and WASHINGTON, subepidemic losses occurred around orchards. The buildup of these infestations appears to be due to the reduction of predators and parasites by spray drift. The insect is not sufficiently important in Oregon and Washington to warrant suppression.

Populations of a spruce MEALYBUG (Puto sp.) continued at epidemic levels within Engelmann spruce stands in southern UTAH. The infestations occur in three separate areas, totaling approximately 60,000 acres. Mortality of Engelmann spruce reproduction is noticeable within the older infestations.

WALKINGSTICK (Diapheromera femorata) was abundant on oaks at several locations in WISCONSIN. The most extensive outbreak, one which stripped foliage on trees attacked, occurred on 30,000 acres in Marinette County. Other infestations of lesser severity and on smaller acreages were reported from Marathon, Dunn, Oconto and Eau Claire Counties. In INDIANA, walkingstick continued in epidemic proportions in Starke County in a second-growth stand of black oaks. Major to complete defoliation had no apparent effect on the oak hosts; however, this species is a potential devastator of other hardwoods, such as maple. Although numerous parasitic tachinids were recovered during both 1960 and 1961 in Indiana, the population appeared to be as severe in 1961 as in the previous year. Walkingsticks, primarily D. femorata, defoliated several thousand acres of oak in southwestern ARKANSAS and southeastern OKLAHOMA during the fall. The infestations in Arkansas were much heavier than those of 1960. Very little damage is expected to host trees from the infestation of 1961 because of the time of year defoliation occurred.

Unspecified species of GRASSHOPPERS caused defoliation of Siberian elm at Esmond, Benson County, NORTH DAKOTA, and injury to pine and spruce transplants was reported in an experimental nursery planting at Bottineau, Bottineau County, North Dakota. In CALIFORNIA, grasshoppers caused some local damage to seedling conifers.

Infestations of a NEEDLE MIDGE (Contarinia sp.) are a serious problem to the Christmastree industry in western MONTANA and northern IDAHO. The area infested greatly increased in 1961.

Various species of GALL MITES were numerous on hardwoods throughout MAINE in 1961.

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